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THE LATEST WORD ON THE OCEANIC CURRENTS.

THE intimate relation of the writer of this article to Dr. Petermann, the distinguished German geographer, has prompted him to prepare the following brief account of the oceanic currents, in which some results are stated which are newer than those that have found their way as yet into our geographical textbooks.

The three great oceanic currents with which hydrography has to deal, are the Equatorial, the Arctic, and the Antarctic. The first-named is the best known of all, and I shall devote but little attention to it here, merely stating that it has a tendency to follow the equator round the globe, and would do so, running from east to west, were it not deflected by the great bodies of land. Its cause—the greater rapidity of the rotation of the earth from west to east, causing the waters to drag behind, and thus form a current—is fully given in every physical geography, and need not be dwelt upon here. I would like to refer the reader, however, to Mr. Morgh's celebrated book, "Man and Nature," published by Mr. Scribner, for some singular, and, at the same time, perfectly reasonable speculations regarding the future history of Europe, should there be at some coming time a ship canal dug through the Isthmus of Panama,—in case the waters of the great equatorial current should deepen and widen the artificial passage, and at last form a strait broad enough to allow the main body of the great current to pass unimpeded westward. There would, apparently, be no reason then for the Gulf

Stream to turn upon itself, and convey the warm waters back to the eastern hemisphere; its waters would follow their normal tendencies westward, and, in the end, strike upon the eastern coast of Asia. Not only would this lower the climate of Great Britain and Northern France to that of Labrador, but it would no less affect the whole character of the Pacific and the western coast of America. It would reshape the history of the globe. The places which are now the centers of civilization would be surrendered to a desolation greater than that which has befallen the mighty capitals of Persia, and Assyria, and Egypt; and places now hopelessly deserted by man would begin to be the thronged seats of life and culture. Such a culmination seems distant and most improbable; yet all great physicists admit its only too great probability.

The equatorial current may be traced in the Atlantic, the Pacific, and the Indian oceans. In the Atlantic, it divides into two parts after striking upon the American shore, the larger of which runs northward in a strong stream, which is very narrow and swift off the coast of Florida, but which opens gradually like a fan, and loses its speed. It has been common not to depict its course much beyond a more northern latitude than 45°, or that of Newfoundland, and then to dismiss it with some commonplace allusions to its influence on the climate of Iceland, Great Britain, and Norway. And writers like Maury, whose studies have been confined mainly to the generalizations to be drawn

from the courses of ships in the usual channels of trade, are to be excused, in a measure, for not being very familiar with its more northerly influences. But students, like Petermann, whose command of authorities is more extensive, have not failed to recognize a more extensive influence than that which is felt on the eastern shores of Europe. The thermometrical observations which have been made upon the northern side of Nova Zembla, where the average temperature is found to be 43° higher than in the corresponding latitude in Northern Greenland, fill one blank in our previous knowledge. The Korean Sea, south and east of Nova Zembla, and which is shut off from the influence of the Gulf Stream, is a frozen and almost impassable body of water; and the lands which touch it are bleak and savage compared with those on the northern side of Nova Zembla, where the influence of the warm current is felt. Nor does it cease there. Look further east to the great peninsula of Taimyr, which juts out from Siberia as far north as the southern shores of Spitzbergen. It is surrounded by an open sea, and has by no means a severe climate. Of Spitzbergen itself, many of our readers know that English yachts go thither every summer to hunt, and the old prejudice regarding its terrors has utterly disappeared. But go further east, as far as to the New Siberian isles, and even Cape Jaktan itself, and in the open sea and in the abundant flora and fauna you have the clear traces of the Gulf Stream.

The weaker arm, which turns southward along the eastern coast of South America, does not double Cape Horn, as some maps falsely indicate, but carries warmth as far southward as the Falkland Isles, and then strikes a strong current from the Antarctic pole, is deflected eastward, and soon ceases to exert a perceptible influence—so far, at least, as observers have yet studied.

The great equatorial currents of the Pacific and Indian oceans must be passed over. They may be found traced accurately in most of our late maps. The Pacific does not appear to have any well-marked returning stream south of the equator; north of it, however, it has the great Japan Stream, so called, whose waters return

past Eastern Asia, the Aleutian Isles, and Alaska, to the American coast, and make the circuit complete.

In the Indian Ocean, an equatorial current strikes the western coast and the Island of Madagascar; but instead of doubling the cape and continuing westward, it bends round sharply, and runs eastward as far as Australia. On the west side of this continental island, it divides into two parts, one of which turns north and joins the equatorial westward current, completing its circuit, while the other passes along the south side of Australia as far as Tasmania, and there forms a circular minor current, running first southeasterly as far as Macquerie Island, then northeasterly to New Zealand; and so round, in a half circle, again to Australia and Tasmania. New Zealand, it will be seen, is in the same latitude with the New Georgian isles, east of Patagonia; but the former possess a delightful climate, while the latter are the home of snow and ice.

From the poles there issue currents, whose natural course is toward the equator. The absence of large bodies of land in the southern hemisphere allows them to follow their natural direction, which the great continents at the north prevent. Near the south pole, there seems to be a general and direct radiation northward—the lines being at first parallel with the meridians of longitude. These begin, ere long, to be slightly deflected eastward, and at last, at about 40° , they run nearly on the parallels of latitude, and due east, forming a weak but very extensive complemental current to the general equatorial one, whose curve is just opposite. The lines of radiation are most faintly observed in the Pacific, and the resultant stream, compensatory to the great westward equatorial current, is scarcely observable enough to be designated on our maps.

These lines of radiation from the south pole carry ice a long way northward, as far into the Pacific and Atlantic as latitudes which correspond with those of Lisbon and Genoa in the northern hemisphere. West of the Cape of Good Hope, icebergs are found in great numbers as far north as Tristan de Cunha. They do not, however, strike the cape itself, being fended off by

the great warm current of the Indian Ocean, which, as I have already said, makes a sharp bend eastward here, instead of doubling the cape. There is, however, a continuation of the cold polar waters up the western side of Africa, whose salutary influences are felt as far north as the Bay of Guinea. This may be relied on, notwithstanding the statement of some authorities that the current is a warm and not a cold one.

The same phenomenon is observable also on the western coast of South America. The radiating lines of water from the Antarctic region strike against Cape Horn, and there part. A portion of them gather, and form a current which is strong enough to check and deflect eastward the warm current which has already been alluded to as setting down the east coast. Another portion, weaker, indeed, but perfectly traceable, runs northward along the western coast, analogous to the one just referred to on the West African coast. This was noticed as early as the Spanish invasion of Peru, and the officers immersed their arms in it to cool them.

In the northern hemisphere, I must refer to the perfectly defined cold current which sets down the eastern coast of Greenland, and which probably conveys the returning waters of the Gulf Stream. The most of it continues its southward

course, joined by another strong, cold current, which sweeps down Baffin's Bay. Somewhat singularly, a part of the current of East Greenland doubles Cape Farewell, and eddies northward, leaving drift-wood brought from the Siberian rivers as far north as Disco. The great polar current does not cease its influences at the latitude of Newfoundland, but follows the Atlantic coast of the whole United States. If the climate of England is raised by the Gulf Stream beyond the natural thermometric average which it would owe to the sun's heat, that of New England is depressed proportionably below it by the cold current from Greenland.

Another similar stream, but one far less important, sets down Behring's Strait, but it can not be traced beyond the Aleutian Isles. Its influence on the northern side of Alaska is so great, however, that walrus are found at a point hundreds of miles further south of a place where, on the southern side, humming-birds are seen. The latter side is exposed to the influence of the Japan Stream, the Gulf Stream of the Pacific.

Such is a brief *résumé* of the chief currents of the globe. I need not say that it would be easy to expand the subject further. It is trusted that the teacher can, with the aid of a polar map, succeed in following the lines indicated.

MOTION.

EVER since it was suspected that there are in creation three separate states, or conditions of existence—namely, *matter*, *motion*, and *spirit*—and that the various degrees or velocities of motion give rise to heat, light, electricity, etc., it has been a problem of some interest to inquire if electricity could not be advantageously used for a "motor" in the place of steam; in other words, whether electricity may not be more powerful and more generally applicable than heat. We, as yet, know little of electricity, its forms of existence, its value, or its capabilities. We have, in-

deed, discovered that all the various forms of motion can be converted into each other; that heat, for instance, can be transformed into motion, and motion into heat, by the least friction; so motion develops electricity by the electrifying machine. Then why not electricity produce motion? By a certain degree of motion we have simply heat; increase it, and we obtain light; a higher or more refined motion gives electricity;—and as matter can not be annihilated by matter, or motion, or any thing, save the power that created it, so *motion once created ever exists*, and can never be

annihilated except by that Omnipotence that called it into being. Like matter, it may be transformed, changed in appearance, or in its effects, yet it never is destroyed; it may become latent, for we speak of latent heat as a common thing. And may there not be latent light, latent electricity, latent motion? The rays of the mighty mysterious sun come to this globe as motion; vegetation drinks it in, and stores it up, as it were, in its woody fibre, and in its varied productions, which may be set free again in burning; or it may be buried with the wood in the earth, converted there into coal, and after a lapse of ages brought to the surface of the earth again, and by use in our steam-engines be once more converted into motion for thousands of spindles, or for the transportation of men and things in countless numbers and endless variety. Part of it leaks out as heat wherever there is friction; and part is diffused in the atmosphere, giving rise to motion in the currents of the air, until lost in the multifarious winds of heaven. Yet not the smallest quantity of motion is lost or finally destroyed. That heat, light, electricity, and perhaps life, are but motion of some kind or other, seems now nearly evident; they certainly are not *forms* of matter, and it accords more with the divine simplicity of creation to consider all these agents—which, to express their peculiarities, we have called imponderable agents—as but one, acting in different ways or degrees, than to assume the existence of many agents to account for the special phenomena they present.

For several years past philosophers have shown both rectilinear and circular motion by means of electricity, but their apparatus have been mere toys, of no practical application whatever. Ingenious men have, however, endeavored to produce a machine working alternately by the attraction of the electro-magnet and gravitation, but, as yet, all such engines have proved to be too weak for the least useful purpose; still, in spite of all these failures, no one despairs of its being successfully accomplished some day or other. Why should it not? We have not surely attained the highest point of human skill and discovery, and there is no good reason why electricity may not

prove a valuable agent for machinery. For upwards of two thousand years electricity was known, as an agent or fluid, to attract and repel, without unfolding any knowledge worth calling science; and although much has been learned of it within the present century, yet much, very much, remains unknown;—it may take years to bring it to practical use in all the modes of which it is susceptible. The only motion we have yet obtained from it, of a valuable kind, is the magnetic telegraph, which gives a weak but wonderfully rapid motion; so that so far electricity seems only adapted to swiftness, not lifting; yet it by no means follows that it never can be used otherwise. We must continue to try, to experiment, for it is a power that would be free from many sources of accident that are incidental to steam, besides being cleaner in its development, and more powerful in itself when properly applied.

The methods heretofore adopted of obtaining motion from electricity have been mainly by converting soft iron into a magnet, or by generating various magnetic currents; but these are obviously not the proper ones to convert electricity into motion for mechanical purposes. An entirely new path of inquiry must be attempted. By the *decomposing* power of electricity we might effect the instantaneous conversion of a liquid into a gas, whose elasticity would raise a piston, and, by cutting off the electric current, return instantly to its liquid state, which is the principle so well adapted to convert heat into motion. Two cylinders thus working alternately would keep up a motion that could be either rectilinear or curvilinear, and thus satisfy the mechanical want. Experiments have been in progress to this end, with some success, and it is hoped a sufficient power will soon be obtained in this way to test the question of the availability of electricity as a mechanical force. At present this mode of generating motion is too expensive, but we must not expect perfection in the start. The earth and the air are both abundant reservoirs of electricity, and all who have the necessary apparatus should aid in this work, by experimenting with various fluids or liquids; the right plan once discovered, machinery to put it into practical use can

readily be invented. This mode of producing motion will form the subject of several future papers, as new points arise, and may have the effect of setting men to thinking; and thought, it must be remembered, produces action, and action discovery, and discovery adds to universal advantage and happiness.

GERMAN EDUCATION IN AMERICA.

THE management of German academies, institutes, or free schools, is a subject to which the growth of the German element in our midst gives especial interest.

Among the objects of study in German seminaries, and in which proficiency is most desirable, are, first, an equally thorough knowledge of the German and English languages and literature; second, mathematics, pure and applied, together with a few of the most important elements in natural philosophy.

There can be no imitation whatever of the American school system, as between the two no analogy exists; for with this last, method and system of inculcation can be arrived at by common-sense means, because they have but one language, one grammar; whereas, the double difficulty of the Germans is that of arriving at some orthodoxal course of tuition, by which their children may compare as favorably, at least, in their attainment of written and spoken English, as those of American citizens, with the advantage of an equal excellence in the mother tongue.

Therefore, to carry out this scheme, it is obvious, in the first place, that the foreign and native elements should be taught by those teachers only who are versed in the science of languages, philologically and comparatively.

The German tutor, thus trained, can impart sound instruction to his class; he is better fitted for explaining, according to the aptitudes of his scholars, the construction of a German or English sentence; he can, of course, more lucidly demonstrate that the adjective must agree with the noun in gender, number, and case; the verb with its nominative case, or subject, in number and person; and that prepositions, which are the signs of different cases, according to their nature and import,

must have the nouns before which they stand in the same case as the prepositions indicate, etc.; then he can point out, either by an English translation, or by some passage selected for the occasion, the similarity or difference in analysis, construction, and arrangement. This system of mental gymnastics, repeated with variations until proficiency be attained, will tend to develop the powers of the mind as physical gymnastics will the muscles of the body.

Again, the class, during the German reading lesson, should be made to write down, as a nomenclature, every remarkable word, with its English translation, as well as every English one, during the English reading lesson, with its German translation. At a convenient season, these words thus treasured in the nomenclature should be spelled aloud, and afterward employed in the construction of English and German sentences, *vice versa* and written.

Translations from either language should not be given as a home-lesson until a certain proficiency is attained, but should be conducted in the presence of the tutor—construed in class—so that others may have the opportunity and benefit of correcting and improving; which accomplished, they should then be legibly written on the blackboard, and copied by the whole class. The lesson should then be retranslated into the original.

It would also be advisable in those classes where Latin and French form a part of the upper studies, to treat upon the derivation of English words—their Saxon, Norman, and Latin origin, with as much as possible of the historical character of the Latin, Saxon, Teutonic, and Norman races; but this, again, it is clear, can be with justice performed only by those who have had a philological and literary training.

Here we would censure what appears to

us a dangerous policy, namely, that of abolishing the study of the Latin tongue in favor of French, when such scholars as Professor Max Müller advocate it as the right material for training the mind of youth, and for forming the foundation whereupon to build the stately fabric of scholarship. It appears to us quite as reasonable to recommend the study of trigonometry and conic sections in preference to the useless study of Euclid. However, we do not wish to be understood as recommending Latin in every class, but only with those which have been hitherto considered sufficiently advanced for the study of French. We believe it may be truthfully stated that the wholesale blunders usually made in construing and analysis arise chiefly from the want of a knowledge of Latin and Latin grammar; the study of which, from its admirable construction, is highly calculated to facilitate the labors of the pupil in the earnest study of modern languages. But we have reason to suppose that those who would abolish Latin from the upper classes of German institutes and academies, would equally favor the abolition of construing, analysis, or parsing, as totally unnecessary in learning a modern language. We presume they would say: Teach our children to speak French, so that monsieur can readily understand them, and we are satisfied; or, in other words, cram them with dialogues, words, and sentences, so that we shall have the unspeakable delight of hearing them gurggle fluently in a modern tongue. Now, we would seriously ask, is this education? Another very

prevalent fallacy is, that Frenchmen only are capable of teaching French. If the antecedents of every professor of French throughout the United States could be obtained, we believe that fully one-half or more would be found to have filled originally the position of laquais, valet-de-chambres, commis, or garçons d'hôtels, etc. This, however, would not prevent us from giving them their full meed of praise for their success in life, if their knowledge had increased with their aspirations; but, as a rule, if these gentlemen do speak or write correctly, it proceeds, not from their grammatical or literary knowledge, but in spite of it. We seriously ask, how can such men, to whom comparative grammar and the science of language are unknown, be educators—imparters of knowledge?

It is the advice of Professor Max Müller, in his review of the public schools of England, that English graduates only should be employed in teaching French grammar and composition, and that the reading and dictation lessons should be intrusted to natives of France. We are of opinion that a similar course would be the correct one in this country, and would be beneficial in both German and American seminaries.

Uniformity of discipline, as well as some recognized system of class-instruction, suitable to German-American schools, should also be taken into consideration.

In future numbers we propose to illustrate our method of class-instruction in English, German, and French, as well as what we conceive to be the most rational system of teaching mathematics.

THE GREAT PUBLIC SCHOOLS OF ENGLAND.

WE have read such varied accounts of the great schools of England, that we have not avoided varied opinions of those "time-honored institutions." Of late, however, the mists which partiality and prejudice have gathered about them have been cleared away, and we need no longer view them "through a glass darkly."

Upon this subject, the philosopher of

Harpers' "Easy-chair" expresses himself so happily, that we know our readers will pardon us for reproducing his views.

The great public schools of England are romantic objects to our imaginations. We are in the habit of viewing them through the tender light of Gray's ode upon a distant prospect of Eton. We think of them as ancestral halls of learning, venerable in themselves and hallowed by tradition. The

ancient vines that tapestry their gray walls, the spacious quadrangles, the studious silence of the buildings, broken by the merry shouts of the play-ground, the indefinable charm of literary association, of which Gray's ode and Thackeray's description of the Charter-house, in the "Newcomes," are such exquisite illustrations—all these things, actual and imaginative, combine to invest the great schools of England with a profound interest, and to recall, when we think of them, the poet's words:

"I like a monk, I like a cowl,
I like a prophet of the soul:
And on my heart monastic aisles
Fall like sweet strains or pensive smiles."

And all this interest is confirmed and justified by the impression, which is quite universal among Americans, that the youth who study at those schools emerge from their reverend shades amply accomplished scholars.

It is a disagreeable awaking from an agreeable dream to learn that we are mistaken. There are hints in "Tom Brown's School-days," and in Thackeray also, which suggest a suspicion that all at those schools is not quite as the imagination paints and the common opinion accepts. But how little they really achieve, how barren of adequate results, how amusingly antiquated in theory and practice they are, few Americans can understand until they read either the original report of the parliamentary commission upon Eton and eight of the great schools of England, or the digest of that report contained in a lively pamphlet by Mr. W. P. Atkinson,* whose profession as a teacher, and whose wide and various acquaintance with all the literature of his profession, peculiarly fit him for the task of commenting upon the report, which he does with great point and felicity.

This commission was appointed in 1861. It consisted of six competent gentlemen, who held a hundred and twenty-seven meetings, examined very fully a hundred and thirty witnesses, personally visited all the schools, instituted the most searching inquiries in every department of the scho-

lastic management, the history, revenues, and details of management, and reported in 1864, in four folio volumes, containing two thousand pages in double columns of fine print. Here, certainly, is copious material for an inquiry into the actual value of these schools.

Mr. Atkinson begins by asking what ought to be the education of three thousand of the sons of the higher classes of England, in her old and richly endowed institutions, and in reply supposes what it is. The youth will find in them, of course, noble libraries and the most admirable apparatus; he will be taught to understand the physical phenomena and the natural history of his country: the future citizen of a great industrial nation, possibly heir to a vast landed estate, and probably a legislator for all these interests, he will be instructed in all departments of science which bear upon these subjects, and will help him to govern and guide them. As one of the governing class of a commercial island, he will be well grounded in history and politics, in political economy, and in physical and political geography. As an Englishman, he will be taught to speak and write his noble native tongue with accuracy and ease, and to become familiar with the great authors who have illustrated and enriched it. Living near the Continent, he will acquire some of the neighboring languages; and will naturally be accomplished in music or drawing, or at least have some acquaintance with their history and achievements.

This is not an unfair statement of what may justly be expected in a liberal course of education for a young English gentleman at an enormously endowed English school. After a careful study of the long report of the commission, Mr. Atkinson gives us the astounding conclusion, which he justifies by details of testimony from the various teachers in the schools, that "in the great schools of England, in the middle of the nineteenth century, the whole of modern physical science—the whole study of the outward world—is, I do not say, pursued imperfectly—it is not pursued at all: it is absolutely ignored as an essential part of education; and a head master of twenty-seven years' standing can be found who

* Sever and Francis, Cambridge, Mass.

says he thinks as a training of the mind it is worthless—it gives no power!”

“What *do* the schools teach?” the reader asks in amazement. Latin, Greek, and, subordinate to these, mathematics. Of the thirty-five masters at Eton, twenty-four are classical, and eight are mathematical; while *three* teach all the modern languages, physical science, natural history, English language and literature, and drawing and music; and this is the proportion in all except Rugby, which is more civilized. Mr. Atkinson does not quarrel with classical study. He is a scholar, and he knows its value. But for that reason he values it justly. It is “the preposterous abuse of classical study and the absurd neglect of science” which seems to him so appalling. The end of education, as he says, being a true and symmetrical mental development, the means must be more various and powerful than the grammar of two dead languages.

But at least, it will be urged, what they do teach they teach thoroughly. Let the Dean of Christ Church College, Oxford, which receives, with University College, the majority of Eton boys, answer. “Some fifty or sixty young men matriculate at Christ Church in the course of each year. Of these, perhaps ten will read for honors in classics. Such men would be able to construe, with tolerable correctness, a new passage from any Greek and Latin author, translate a piece of easy English prose into tolerable Latin, and answer correctly simple grammatical and etymological questions in Latin and Greek. *The other forty or fifty would not.*” These last can scarcely construe properly the authors they profess to have read. They are examined in the first four books of the *Æneid*, and the same of the *Iliad*. They are not examined at matriculation in ancient or modern history or geography. They are tested in arithmetic, but not in algebra.

There is, probably, hardly a boy who has been examined this summer for admission to any of our colleges who is not better fitted than the great majority of those who come up every year from the great English schools to enter the universities. Of study at the university, Mr. Atkinson does not treat at length. But it is interest-

ing to compare Gibbon's account of Oxford a century ago with the two papers upon the same university by Professor Goldwin Smith, lately published in “*Harpers*.” Mr. Atkinson says, trenchantly: “Oxford and Cambridge are little more than cockpits on a larger scale, and for older combatants to engage in contests of the same kind as those at the schools.” And he then naturally asks, “Whence come the real scholars of England?”

This question he answers by saying that the really fine scholars in England are fewer than we suppose; and that the English aristocracy, as a body, are not well educated. The best scholars in that country he believes to be self-educated or privately trained. The ignorance of many of those supposed to be of the scholarly class and the narrowness of university training, he illustrates by the gross ignorance of statesmen like Lord Derby and Mr. Gladstone in regard to our war.

Meanwhile, England herself is moving toward reform. The old institutions are so intensely aristocratic that new schools for the “middle class” are already established, where the experiment of a modern education is tried, and with success. Such are Marlborough, Wellington, and Cheltenham colleges, and the City of London school. Mr. Atkinson's idea of a true reform is, that it must found a course of liberal education, represented by a more thorough study than at present of the *Latin* language and literature, as the foundation of a study of language and general grammar, and of a knowledge of the kindred modern tongues, but in which the study of Greek shall be *wholly* superseded by a real study of the mother tongue and their languages, and in which the study of physical science shall be begun with the earliest development of the observing faculties. Not the least interesting part of his pamphlet is the testimony of eminent scientific men in England—such as Sir Charles Lyell, Professor Faraday, Professor Owen, Dr. Hooker, and Sir J. F. W. Herschell—to the insufficiency of the present system.

From these fragmentary hints the great interest and value of Mr. Atkinson's little work may be conjectured. It is notable,

also, as an illustration of the present tendency of the American mind to emancipate itself wholly from its old superstitions in

regard to England—an emancipation which will inevitably result in a more intelligent and cordial friendship.

AUTUMNAL BOTANY.

I HAVE just returned from an excursion in the country, a few miles beyond the city limits. I went thither from the turmoil of the city to seek refreshment for body and soul in the pure breezes and holy influences of Nature. I directed my steps, as usual on such excursions, into the deepest, wildest woods, as far as possible from the abodes of men, and from the haunts of browsing beasts. At length I found myself in the midst of thickets blooming with wild autumnal flowers in great profusion. All the enthusiasm of the poet, artist, botanist—whatever I possessed—was at once aroused. Ye flowers that adorned the haunts of my childhood! flowers that I had puzzled over in the botanic studies of my schoolboy days, and whose names I had settled according to the oracles of Linnaeus in the *Florula* of Bigelow! sweet, smiling, beautiful things, how they transported me back to the days of halcyon memories! how completely they softened the crabbed austerities of a careworn, worldly heart!

There, most attractive of all, were the Asters, an innumerable host, whose mazy forms often confound the keenest scrutiny of science;—the smooth blue Aster (*A. levis*); fairest of all, the white-flowered Asters (*A. multiflorus*, *A. cricoides*, etc.); the broad-leaved Asters (*A. cordifolius*, *corymbosus*, etc.). Then the Goldenrods (*solidago*), always golden in color, of endless numbers and sorts also;—a tuft of light-green, lance-shaped leaves at the surface of the ground, spreading like rays; in the center, a slender stem rising one or several feet, clothed with scattered leaves, which, as in the Asters, become smaller and smaller upward. Branches grow out near the top, as if a little tree, bearing a mass of golden inflorescence, consisting of little tassel-form compound flowers; each flower being, in fact, not *one*, but about

thirty flowers bound together, in a definite order, into a sort of nosegay.

What wonders of infinite skill and power are displayed in this little neglected autumn plant! for the plant may ordinarily bear some five hundred of these compound flowers, or heads of flowers, while each head consists of about thirty true flowers; and each or any one of these fifteen thousand flowers, being submitted to the microscope, appears a paragon of perfection, a little gem of beauty—having its two styles in the center encircled by five curious stamens, with their many globes of pollen skillfully carved and wrought; then a corolla of two forms surrounding the stamens as a cup; then a calyx consisting of white shining bristles, and all mounted on a seed-like germ of exquisite workmanship.

And it is not enough that these plants are thus complex and complete in their structure, but they are also varied in *species* to an extent which affords an inexhaustible source of interest to the scientific inquirer. But Asters and Goldenrods, although so immensely multiplied and multifarious, are but a small part of the autumnal flora. Sunflowers (*helianthus*), in more than twenty different kinds; Dropflowers (*nabalus*), of a dozen sorts; Coriopses, Rudbeckias, and Girardias now blaze and bedeck the hedges and copses everywhere—plants, any one of which has attributes capable of awakening a chord of harmony, a gleam of sunshine, in the human soul, if only observed in the light of science and in reference to its great Designer. As I viewed these objects of interest, a sense of waste or loss stole over me, reflecting how few, how very few, have learned to know and to love these autumnal flowers.

For, in the first place, the science of Botany, although relating to the most interesting and important department in the natural world, is very generally excluded

from the public schools, and from other schools where *young men* only are taught, and assigned only to female seminaries and institutes, as though it were a mere accomplishment! The science of plants, trees, of vegetable life and growth, clothing and crowning the whole earth with riches and beauty—the knowledge of this science a mere feminine accomplishment! The prevalence of this notion can be attributed only to prevailing ignorance of the nature of the study—that is, ignorance of the science itself. Regarding it as treating of the form and color of flowers, counting stamens, etc., it might well come to this disrepute; but considered as revealing the laws of plant-structure, organization, life, and growth, and as reducing the vast system of vegetable life to one original *unique idea*, susceptible of being grasped by the human mind, Botany becomes not merely an accomplishment, but a *discipline*, adapted to the development of the noblest manliest powers of the soul.

Then, secondly, in the few and select schools where Botany is permitted as a study, it is assigned to the course of the spring and early summer only, and concluded usually in July. The teacher conducts his class through an investigation of those floras represented in his vicinity, and at midsummer their botanical pursuits are concluded for the season. Hence the beautiful plants which bloom only in the autumn, and the few lingering relics which open at last in winter, are neglected, and comparatively unknown. It is true that the learner is enjoined, in the closing addresses of the teacher, to persevere in his or her investigations unaided and alone, and to complete, as an amateur, what he had begun as a pupil, viz., the entire botanical circuit of the year. And there are some who, having been duly instructed, and made independent of teachers, *do* thus persevere, and reap a rich reward. These, however, are too few, where such an abundant feast is spread for all.

CORPORAL PUNISHMENT IN SCHOOLS.

THERE are works of fiction which are valuable addenda to the more ponderous labors of the historian. Such, certainly, are many of Sir Walter Scott's romances. The ever-changing scenes of national life which are pictured in the pages of Robertson and Hume, are illustrated and embellished by the finished figures and home scenes which adorn the tales of "Old Mortality" and "Ivanhoe." In like manner, but without presuming to hope for a like success, the writer of this article proposes to submit an old teacher's opinion on the subject of corporal punishment, which has already in this periodical been so ably, historically, and legally examined by previous contributors in the papers entitled "Pedagogic Life" and "Pedagogical Law."

The glorious uncertainty of the aforesaid law might also be pleaded in justification of this article, for while the use of the ferule is permitted by the highest legal authorities of Vermont and Massachusetts,

the coequal authority of Indiana with a wisdom surpassing that of Solomon's (if its conclusions are correct) asserts, and ex-Senator Dix, of New York, defends, the contrary opinion. Under these circumstances, well may the bewildered schoolmaster, or pedagogue as he is termed in the papers before us, exclaim with the ill-fated Desdemona,

"I do perceive here a divided duty;"

or, if irascible, as unfortunately some schoolmasters are, would he not be almost justified (on beholding, instead of a stable law, this Babel of conflicting opinions), were he to consign such uncertain sounds to oblivion, and do his duty according to his conscience, regardless of whatever unjust penalties might be imposed on him for so doing?

Therefore, with all due deference to the Supreme Court of Indiana, it is the purpose of the writer to contend for the right of all principals of schools to inflict reason-

able punishment upon the children committed to their care; and to indicate the crimes for which, and the manner, the way, and the place in which such penalty should be inflicted. But before proceeding with the direct elucidation of the argument, it is right to say that this paper is written in defense of all schoolmasters, public as well as private. It is assumed that it is the intent, even of the State of Indiana, that all her children should be educated, and certainly those who lack such proper training at home are most in need of her especial care. The children of thieves, gamblers, swearers, and drunkards, if there be any such in Indiana, are obtaining one kind of education before they enter the doors of the school-house; but it is an evil one, and must be eradicated. Before you can hope for a good crop you must extirpate the weeds from your garden. It is often, alas! too often, necessary to punish the crime of the parent in the child. But instead of withholding from the teacher the power to exercise this necessary right, an experience of many years proves, to the satisfaction of the writer, that the sway of the teacher ought rather to be extended, to enable him to reach thoughtless or vicious parents with a ferule of double strength. But this is a hopeless wish, though the present condition of the country painfully proves that the law, notwithstanding its multifarious ramifications, is as unable to prevent the extension of crimes of all kinds as it is to point out decidedly and accurately the path of duty to the schoolmaster. We now proceed to the elucidation of the subject in the order above mentioned, commencing with

THE CRIMES FOR WHICH CORPORAL PUNISHMENT SHOULD BE INFLICTED.

1st. Rebellion or confirmed disobedience. No school can be rightly conducted in which the authority of the principal is not absolute. If the orders are incorrect, the teacher is amenable to the local powers and the law. "Will you study this lesson?" "I will not." There is no conquering this difficulty but by compulsory subjection.

2d. Repeated lying, repeated thieving, repeated swearing, and repeated gambling, after long and careful admonition for previous errors, demand the same treatment.

These are acquired vices, sometimes learned by the child at its home, but there is no other effective remedy. The good teacher has duties to perform to the other children in the school as well as the delinquents, and for their sakes punishment is rendered necessary. Adult thieves are not punished by the law for a national amusement, but to protect the innocent, and deter the unwary from committing the same crimes. These reasons hold good in the school.

3d. *Per contra.* Let the schoolmaster ever remember, before resorting to any punishment, the advice in the play above quoted:

"That his probation bear no hinge nor loop
To hang a doubt on. Or, we upon his life!"

It is impossible to overrate the evil effect of one unjust corporal infliction; it is very frequently remembered for life, and often cultivates for years in the recipient the worst of human passions. It is a wise maxim in our courts of law to give the prisoner the benefit of every doubt. It should never be forgotten in our schools.

THE MANNER IN WHICH CORPORAL PUNISHMENT SHOULD BE ADMINISTERED.

1st. The very first requisite of a schoolmaster is the perfect control of his own feelings and passions. It is the foundation of good government. Punishment inflicted in anger is an absolute crime of the highest magnitude on the part of the teacher. From such infliction no good result can be expected; it is productive only of evil on both sides. The classics, the mathematics, and the arts can be and often are imparted to youth by delegate authority; but the power of government and the strictest self-command are absolute requisites on the part of all principals of schools.

2d. As a rule, no child after receiving chastisement should be permitted to leave the presence of the schoolmaster until it is assured of his constant affection. This doubles the good effect, and should be a consequent of all punishment. On the part of the teacher this sympathy must be genuine, for almost all children can instantly detect that which is simulated. Affection is God's coin, if it be frankly given. It must and ever will be returned by youth in the same holy currency.

THE WAY IN WHICH CORPORAL PUNISHMENT
SHOULD BE INFLICTED.

1st. Firmly. A slight punishment is not only useless but positively injurious. It is an advantage gained by the child. A judicious teacher is very seldom compelled to use the assistance of the ferule. No punishment should be so frequently resorted to as to render it common.

2d. Probably the method of punishing on the hand is the best that can be applied, for two reasons: firstly, because it inflicts sharp pain; and secondly, because it leaves no disfigurement. A jury of mothers will never agree upon the right spot on which to whip their children. Their feelings in this matter may be compared to those of the soldier who was undergoing the penalty of a military flogging from the hands of a friend. At first he said, Higher! higher! then, Lower! lower! until his friend, whose patience was exhausted, exclaimed: "Confound you, Sam, there's no pleasing you!" It will ever be the same with parents.

THE PLACE IN WHICH CORPORAL PUNISHMENT
SHOULD BE ADMINISTERED.

1st. Always in private. A teacher has no right to degrade other children by a public exhibition of necessary brutality, unless they have been minor participators

in the same crime. Even then it is very doubtful if it be politic. The skeleton at the feasts of the Egyptians was only the more revolting because it was hidden by a veil. The same effect is produced by private punishment. A wise parent would not let his child behold the cruel flogging even of a brute. The hardening process of such an exhibition upon either children or men is very pernicious. It deadens the conscience, stimulates the cruelty, and brutifies the mind of the beholder. Nothing should be exhibited to either man or child which tends to lower the sacred value of humanity. For these reasons public flogging may be said to create rather than suppress crime.

In conclusion, the writer trusts that the reading public will weigh these statements, and not lightly sentence him as an advocate for unnecessary cruelty. A long experience in the field of education has given him a right to speak on a subject in the study of which he has passed thirty of the best years of his existence. He is quite willing to admit that in a small private school, in which the pupils have for some time remained under the charge of a careful instructor, corporal punishment may be superseded by expulsion. But this paper is written for all classes of schools, more especially for the public schools of the States.

THE STORY OF PETER PEDAGOGUS.

A SWISS SCHOOLMASTER OF THE OLDEN STYLE.

CHAPTER III.

A PRIMITIVE NORMAL SCHOOL IN SWITZERLAND.

THERE were, in all, about twenty in the class; some of them schoolmasters who had appointments, and others who wanted to get them. In the evenings, a few went home; the others boarded, like myself, here and there in the town. I had made the acquaintance of one of my class-fellows, to whom I disclosed the state of my finances, and my prospects generally. He advised me to offer to do some weaving for my landlord, as part payment, out of school-hours; the latter having no objec-

tions to this arrangement, I was released from all embarrassments of a pecuniary nature.

Our subjects of study were reading, writing, grammar, combined with constructing, composition, arithmetic, and singing. Of elocution nothing was said, our attention in reading being merely called to the stops, at which we had to drop the voice, more or less. To read fluently was a matter of difficulty for most of us, but, by the time of our examination, we had mastered that. Grammar was taught by dictation, and those who could not follow, copied from the *cahiers* of the others—at

least those who could read written matter. I do not recollect what these exercises consisted of, for I never after consulted my note-books, and can not refer to them now. The parts of speech were alluded to—the words, if I mistake not, being divided into twenty-four classes. The cases of the nouns and the tenses of the verbs were touched upon; but what further I can not now call to mind.

Construing, however, was the grand point with me. In this, we operated upon the text of the Bible stories. The teacher first called our attention to the fact that between one full stop and another there must be at least one verb, which indicated the time and manner of the incident, state, or act referred to. A sentence was then read, and we were required to find the verb; or, if more than one, that which governed the others. We often guessed through all the words before we found the right one. When this was ascertained, we had to answer who? whose? whom? to whom? by whom? when? what? which? and so on. After all the words had been questioned off in this way, the sentence was done with.

Generally attention was called to the nouns, which we learned to know by the capital letters. But of the other words little notice was taken. The great mystery, construing, turned out to be nothing more than parsing, with special reference to the nouns and verbs. No proper definition of the parts of speech was given us; indeed, I am not sure that our teacher had any very definite notions on the subject. At one of the preparatory examinations, the school commissary asked us what the word Palestine was. Instead of saying it was a proper noun, one of us, prompted by the teacher, said "the capital of Judea," whereupon the examiner looked as if he thought we were too clever by half.

At writing from dictation, we were all alike slow. First, we had some difficulty in catching the words as pronounced. Next, there was a doubt about the letters, and then how the words were spelled, so that we had no time to think of their meaning. The stops were read to us, so we had no great difficulty with them. When we had finished, the teacher gave

the book to one of us to spell aloud each word, so that the mistakes made might be corrected. None of us, however, were able to keep up with the speller, and usually half of the mistakes remained. We exchanged slates with each other, in the belief that we could detect the faults of our neighbors better than our own; but this was of very little benefit. Usually the speller pronounced half a dozen letters, while we, in our awkwardness, were occupied in correcting one; and I thought, at the time, that to write and to listen at once was a kind of wizard's work, which no honest Christian could reasonably be expected to do.

We got over our arithmetic with wonderful expedition. All manner of sums were wrought out in an amazingly short time; the four fundamental rules, both with and without fractions, were dispatched in a twinkling; cubic measurement was confined to the dimensions of hay-stacks; the Rule of Three, Fellowship, and Interest were summarily disposed of; we even closely approached the square-root and chain-rule. The way we managed to get on so rapidly was this: the teacher cried out, "Attend!" wrote an example of a rule on the blackboard, and told us to copy it into our exercise-books, so as not to forget it. One or two of the pupils then wrote on the board one or two other examples of the same rule, those having a good memory copying stroke for stroke what they had seen done before, and we were finished.

Much time was taken up with catechising—the agony of the prospective schoolmasters, and the delight of the established ones. This consisted in answering from memory the questions in the catechism, which, being regarded as a synopsis of the doctrines of Christianity, was deemed sufficient to enable us to pass our examination in theology. Nothing was explained to us, nor were we told any thing about the differences between the Roman Catholic and Reformed Churches, of which it might have been useful to us, as teachers, to have known something. We repeated the answers in the catechism much as bullfinches pipe words and sounds which they do not understand.

When we had been catechised almost to

our wits' end, we proceeded to singing, and from singing psalms to "figural," that is, to singing from written music. We were taught the meaning of the marks denoting flats and sharps, and were told how to divide the notes into halves, quarters, and eighths, how to keep time, and how to distinguish the bars. Then we sang till windows clattered, and the crickets in the oven began to dance. Thus we usually closed our day's lessons.

It will be observed by the discerning reader that we really learned very little; and, if the manner we were taught this little be taken into account, it is surprising that we learned any thing at all. That we should obtain some acquaintance with the subjects taught seemed the sole consideration; whether it could be made any use of, or whether we could apply it in teaching children, did not seem to be thought of. We were not told how to develop the intellectual powers of the young mind, nor were we told how to digest the matter taught us, so as to place it before young people in an intelligible form.

So far, then, as regards my own experience of the Normal School, I was taught very little, and was not told how to impart this little to others. There were a hundred things told us that we did not understand, either because the teacher could not explain them in a manner adapted to our faculties, or because he thought we knew them already. We were, consequently, not told to avoid presupposing any thing in children, and to make every thing placed before them perfectly clear. This "taking for granted" is fatal to well-regulated instruction, checking all development in young heads and hearts, and engendering the habit of pronouncing words without thinking of their import. Presupposing is a cancer in our schools. It certainly is difficult for us to go out of our knowledge and our wisdom, and make ourselves at home in such a small space as a child's head. Still more difficult is it to look about there for what it contains and what is wanting. Yet all this must be done by one who desires to teach a child, and find an entrance into its heart as well as its head. He must find out what is deficient in both, then steadily and cautiously

fill them up, as the bee in its hive, which, with wonderful instinct, first makes the combs, then builds up the cells, and finally fills them with luscious honey.

To acquire knowledge was the object of myself and fellow-learners at the Normal School. All deeply felt that the knowledge they possessed consisted of fragments, and deeply as they prized these snatches of learning, they knew them to be insufficient for their calling. All were hungry and thirsty, absolutely famishing for wisdom; but the means adopted at the school were incapable of supplying the want. We knew what we knew; but what it was, or how much it was, we had not the slightest idea; neither could we form a conception of what we required to know, save and except some names, such as construing. Real knowledge was hid from our view by an impenetrable curtain, such as hides the future from the human mind.

All of us had to struggle with a thousand difficulties in order to attend the training-school. Some had to deprive their families of their summer earnings, that could ill be spared—had to wear their Sunday clothes, which ought to last a schoolmaster many a year, and had to look forward to a winter of privation.

Luckily for us, we did not know that we were learning next to nothing. On the contrary, we fancied ourselves on the straight road to eminence; and were busily laying up a store of school lessons for future use. There was a man, who came every now and then to visit us, who professed extreme erudition. In oratory, he said, no man, be he layman or clergyman, could cope with him. He assured us that many things printed were inferior to his productions; adding, he did not compose any thing for himself, only for good friends who requested him to do so. We looked upon this man with profound respect, since he had progressed so far as nearly to have his productions appear in print. Therefore, we entreated him to favor us with some of his writings to copy. He very willingly brought us a few, giving the history of each, its conception, birth, and purpose. Once he lost a small sack-full of them; how, or where, we could never make out. Each of us would have been

delighted to have found them. But none of us, I believe, would, in such a case, have restored the documents to their proper owner.

Although, from the beginning, we had labored very hard, it was nothing compared to our zeal when the examination drew nigh, and our course of instruction was coming to a close. Then, we scarcely knew whether we were walking on our heads or our heels. Let no one suppose, however, that this increased diligence was merely the "examination fever." There were other causes of tribulation, the chief of which was, we had to appear before the Ecclesiastical Court at Berne. Our hearts throbbed through fear of being rejected, on account of some bit of knowledge forgotten, or something that we had not been taught. The fields of knowledge we knew still lay hid behind a thick veil. The teacher had handed us crumb after crumb; but how much there remained we knew not. We rejoiced over every morsel vouchsafed to us, because it was new, and because it was a morsel; and how proud we were if we succeeded in gorging it, though this was not always the case. There were a few among us who, possessing sluggish souls and inert bodies,

slumbered when they ought to have listened, and gaped when they ought to have been writing. Of these, we were ashamed; fearing that if the magnates at Berne began the examination with one of them, a bad impression might be formed of us all. For if once a gnat settles behind the ears of such personages, it is difficult to put it to flight; at least, without a deal of fanning and flutter.

If a man of sense and feeling had watched our proceedings at that period, he probably would have burst out laughing; but, at the same time, his heart must have bled with sorrow. Yet this truly was the way in which schoolmasters were trained.

There may have been normal schools that carried on their operations more intelligibly, although I never observed much difference between the pupils from different establishments of the kind at the examinations which I had occasion to attend. It was thought a schoolmaster might learn all he required in a few months, though it takes as many years to turn out a good tailor. From this, the light in which a schoolmaster and his acquirements were regarded by high and low, may be readily judged.

COMMERCIAL COLLEGES.

THESE institutions, like all others of value, originated in a public want, and have attained their present character and position by the development and growth of that want. Their first appearance in this country was in the form of a partial attempt to educate young men for business pursuits, by combining commercial arithmetic, book-keeping, and a higher order of penmanship, with studies not peculiar to such education.

This imperfect commencement was soon found to be inadequate to the popular demand, and led to the establishment of schools more exclusively and extensively devoted to the object that gave them birth. Pioneers conceived the idea of reducing

the experiences of the business world to a science which, like others, could be taught and acquired as an important preparation for the duties of active life.

Their systems of instruction, however, were entirely theoretical; and, though in their arrangement and explanation of the laws of trade and the forms of commercial intercourse they were thorough, and furnished their pupils with a comprehensive philosophy of their anticipated pursuits, they failed to give them the proper qualification to enter upon those pursuits. A mere knowledge of theory is but half the requisite preparation. To know how a thing *ought* to be done, and to be able to *do* it, are distinct attainments by no means

necessarily associated. Every vocation has its *science* and its *art*, and when both are mastered—as they must be to succeed—they exist in mutual dependence, one as a familiar theory, the other as a practical habit. The mechanic has a system of rules by which his operations are directed. These, of course, are matters of study, and must be understood; but alone they do not give him the mastery of his trade. He must learn not only how it should be performed, but how to *perform* it.

So the *merchant* who comprehends the *principles* only on which his pursuit is to be conducted, enters upon it comparatively incompetent and powerless. The capacity to discriminate the qualities of goods, to conduct shrewd and profitable trade negotiations, to estimate the value of property, to construct every species of contract, in a word, to perform all the various transactions that constitute the practical details of his vocation, must be acquired, or his theoretical knowledge will avail him but little.

Hence another and very important step was taken in this grand educational movement, namely, the addition of a department of *actual business* in which all the operations of trade and commerce are carried on, and students are brought in contact precisely as men are in the great mercantile world. They buy, sell, and barter; deal in all kinds of goods and real property; reduce to writing all forms of legal obligation; make conveyances, effect insurances, conduct banking operations, and negotiate all kinds of business paper, notes, bills, checks, and drafts.

Under this double training in the science and the art of their pursuit, they simply do what is done in every other—they learn their trade before they attempt to practice it. This is the universally accepted philosophy. Even for the easiest and simplest avocations a course of preparatory instruction and drilling is deemed indispensable. And why should it not be in the great and complicated pursuits of commercial life? To supply this desideratum commercial colleges are now furnishing facilities.

In addition to the more immediate and legitimate objects above referred to, it was

found desirable to afford to students the means for acquiring the arts of phonography, telegraphy, and ornamental penmanship; and these are now incorporated with the system.

Thus has the commercial college become a great, necessary, and permanent institution, with a wide field for operations; and it is destined to produce unexampled effects upon the business character and social destiny of the country. To the vast multitude of young men about to enter upon the theatre of public activity and enterprise, its importance cannot be overstated. It offers them an opportunity for mastering the principles or practice of their vocations before they are assumed, which gives them an advantage over all others, brings their services into immediate requisition, and secures to them at once a competent remuneration.

But with all the improvements which these important schools have made in their practical designs and modes of instruction, they still retain one gross and obvious imperfection. The elementary studies which enter into their system of education are many and difficult. And yet, with all these, together with a great variety of practical exercises, they promise to make the pupil familiar in the short period of twelve weeks. This proposal is a false, not to say fraudulent, assumption. It carries its absurdity on its very face. Its realization is a practical impossibility. That this allegation is true is the plainest suggestion of common sense. And before these institutions can receive the respect and patronage which their high objects and successful operations ought to command, they must abjure this limited course of necessarily superficial instruction and training, and make a year, or at least six months, of actual membership and assiduous application indispensable to graduation. This high ground, we are happy to see, has been assumed by one, and we believe by only one, of these numerous institutions. It is Burnham's American Business College, in Springfield, Mass., which seems now to have no rival in the thoroughness of its course, in the honesty and practicability of its promises, the extent of its popularity, and the consequent rapidity of

its increase in the number of its pupils and the range of its influence. These advantages have been the double result of superior management and an extension of the time of its scholarship to a period

more consistent with the knowledge to be acquired and the practical skill to be attained. We are convinced that the Springfield school has just claims to public confidence.

ACCENT AND EMPHASIS.

IT is a strange fact that in our American reading-books, most of which have elaborate and otherwise appropriate treatises on elocution and declamation, there is wanting a distinction between the *regular* and the *irregular accent*, and between the *regular* and *irregular emphasis*. The regular common or grammatical accent and emphasis are not spoken of, while the irregular or rhetorical are enlarged upon. They seem to presuppose that each pupil knows, or at least that the teacher can not fail to know, where this regular accent and emphasis take their places, and that, therefore, it is necessary only to point out the rhetorical use of these two means of making language intelligible and beautiful. Yet it is obvious that the pupil must learn how to read *correctly* before attempting to do so *beautifully*.

Accent is a stronger intonation given to one syllable of several constituting a word. This intonation consists not only in a higher *pitch*, or key-note of the voice, but also in a greater *force*, or volume of sound, so that the rest of the syllables of the same word be slurred both in pitch and force, and no less in the time devoted to pronunciation.

Emphasis is a stronger intonation given to one word of a sentence composed of several words. This intonation or *accent of the sentence* consists, likewise, both in a higher pitch and a greater force of the voice, so that the balance of words in the sentence be comparatively neglected in these respects, and less time spent in their pronunciation.

Accent and emphasis are means to make language intelligible, by subordinating in pitch and force and time of pronunciation the several components of a word or a sentence to the most important of its syllables

or words, so that the word or the sentence appear as a unit, an organism. Pronouncing, for instance, the word *godliness*, we lay stress on the first syllable *god* (we accentuate it), and less stress on the other two syllables *liness* (we slur them), in order to make the hearer understand that these three syllables form one word. In pronouncing the sentence, "All men must die," we lay stress on the word *die* (we emphasize it), and lesser stress on the first three words (we slur them), in order to make the hearer accept the four words as a unit, an organism.

In all unmixed or original modern languages the *accent* falls on that syllable of the several constituting the word which contains the *root*, and has, therefore, the greatest significance among them. So it was also in Anglo-Saxon. But in polysyllabic words there may be a second, nay, even a third accent besides the main accent (the secondary and tertiary being weaker in pitch and force than the primary), in order to facilitate pronunciation and intelligibility. In mixed language, such as modern English, this law is, as a rule, so far disturbed, that words belonging to the original stock (in our case, Anglo-Saxon) follow the above general law, while words adopted from a foreign tongue follow, more or less, the law of accentuation proper to these tongues.

In compound words the accent (the *grammatical* accent) is regularly on the *first* component, while the second or third is the bearer of the notion, determining whether it is a noun or a verb, etc.; whether it is singular or plural, masculine or feminine, etc.

In a sentence, the *emphasis* (the *grammatical* emphasis) is regularly on the *predicate*; or if the predicate has a complement,

it is on the latter; or if the complement has another complement, it is on the latter, and so on. Examples:

The moon is a satellite.

The moon is a satellite of the earth'.

The moon appears'.

The moon appears in the horizon'.

The moon appears in the horizon of the observatory'.

The moon appears in the horizon of the observatory of Paris'.

If the sentence is long, it may be made more intelligible by a second and even a third emphasis, subordinate in degree to the primary. Thus, in the sixth of the above sentences, *horizon* may have a very weak, *observatory* a slightly stronger, but *Paris* must have the strongest emphasis.

This is the very simple and rational theory of the grammatical emphasis, to which may be added a few rules, the reason for which will be given below. 1. The *copula*, or auxiliary verb, never has the grammatical emphasis. 2. The subject has it only when by inversion it is placed at the end of the sentence. 3. An adjective never has the grammatical emphasis. 4. And the negation has no grammatical emphasis.

The very simple reason for these laws of all language is the following: The most significant word of a sentence is that which brings in something *new* before the attention of the hearer. The subject is presented to him as a well-known thing, of which he is to learn something new in the predicate. Therefore the latter, not the former, is emphasized. But if the predicate is modified by some complement, it is the latter which engrosses the attention. In the sentence, for instance, "The moon is a satellite of the earth," the hearer is supposed to know already that the moon is a satellite. It is the new fact that the moon is a satellite of the *earth*, and of no other planet, which is predicated, and to which his attention is invited; wherefore, *earth* is pointed out as the word deserving the hearer's attention. In the sentence, "There was a conflagration," the subject is *conflagration*, the predicate *there was*; but the latter, mentioning only the fact of existence, is unworthy the hearer's attention; and it is for this sole reason that the

sentence is inverted—the subject placed in an uncommon place and emphasized. The auxiliary verb never contains a notion, but is only a form-word, showing relation between subject and predicate, and fails, therefore, to engross the prominent attention of the hearer. The adjective has no grammatical accent when it is an attribute, because it does not predicate any thing new, which it does only when predicatively used.

It is for the same reason that, in a compound word, the *first component* is accented. The latter contains the new thing, or quality, or property, or relation of the second, to which the hearer's attention is to be drawn.

How important it is that the pupil should first instinctively learn how to place the grammatical emphasis, and next should understand the above simple theory, before attempting the rhetorical use of emphasis and the understanding of the rhetorical theory, a few examples will show. In the sentence, "The king is dead," the predicate *dead* will have the regular or grammatical emphasis, if the death is to be mentioned as the new thing before unknown to the hearer; but *is* may be rhetorically emphasized, if a doubt of the fact had preceded and is to be set aside; and *king* may be emphasized, if there is, rhetorically, a doubt presupposed about the dead *person*, which is to be solved. Now, how is the child—the beginner in reading—ever to find out the difference between the ordinary and the extraordinary *meaning* of the sentence, if he does not feel the difference between the ordinary (grammatical) and the extraordinary (rhetorical) *emphasis* of the sentence? How is he to apply a correct exception, if he does not know the correct rule; if his feeling, taste, or instinct is not so trained as to intone always the predicate, or the modification of the same, as conveying the real news and purport of the sentence as long as there is no visible, tangible, unmistakable criterion of the sentence being rhetorical? In the sentence, "Charles is a good boy," the regular intonation rests on *boy*. Emphasizing *good* would indicate that a doubt had been expressed about his character. Now if the beginner be so trained as to emphasize *good*

always, even though such a doubt had not been entertained, he loses gradually the perception of all that is poetically beautiful, or rhetorically significant or sublime, because it is the uncommon in emphasis which is bearer of the particularly significant, the beautiful, or sublime.

There is much barbarism in our American elocution and rhetoric, owing to the fact that our teachers do not lay a sufficient foundation in correct grammatical accentuation and emphasizing before embarking with their pupils in rhetorical elocution. We give here a number of cases of incorrect accentuation and emphasizing, such as are likely to pass unrebuked in many of our schools:

WRONG.

1. This is none' of your business.
2. He will be here to-night'.
3. They are no' better than they ought' to be.
4. Our sun is, perhaps, the smallest' of all suns.
5. You devote yourself entirely' to dancing.
6. Lukewarm'. Housekeeper'. Burgomaster'.
Alm'ghty. To wake' up. Steam-engine'.

CORRECT.

1. This is none of your business'.
2. He will be here to-night.
3. They are no better' than they ought to be'.
4. Our sun is, perhaps, the smallest of all suns'.
5. You devote yourself entirely to dancing'.
6. Luke'warm. House'keeper. Burgo'master.
Al'mighty. To wake up'. Steam'-engine.

In all the above examples, what we call the wrong emphasis and accent is, indeed, not wrong in itself; but only it is not the *grammatical*, it is the *rhetorical*, intonation which ought to be reserved for the expression of the less common cases, when there is either an opposition to be expressed or implied, or some other rhetorical purpose to be attained.

For such of our readers as are not conversant with "Comparative Philology" and "Becker's Reform of the Grammatical System," it will be necessary to state that there are two kinds of objects or complements of the predicate, to wit: the complement *proper* and *improper*. The former is that which *modifies* or more closely *defines* the predicate, more or less alters its meaning, and therefore forms, as it were, *one* word or expression together with it, while the latter only completes it. In the sentence, "Make way!" the predicate *make* is so modified by its direct object, *way*, as to form a new notion together with it. But in the sentence, "I simply obey the law in every respect, and at all times," *law* is the modifying, "in every respect" and "at all times" are only completing objects. The former is that which has the grammatical emphasis. The entire subject demands greater consideration.

LITERARY NOMENCLATURE.

THE fashion of using odd phrases and mottoes, as titles for novels, is ridiculed by an English satirist, who has made good use of publishers' circulars.

"Belial," he says, emerged "By the Sea;" advancing against "Wind and Tide" he saw, "Beneath the Surface," "Breakers Ahead." This was "A Bad Beginning"—a kind of "Notice to Quit;" so he turned into "Belforest," and encountered "Some Famous Girls" (both "Black and White"), who have since become "Famous Women." He beheld "Eleanor's Victory" and "Christian's Mistake," and heard "Cary's Confession." Here be "Shattered Idols" and "Singed Moths," quoth he; "Grasp your Nettle," but "Look before you Leap," for "Who Breaks Pays." It was just

the "Darkest before Dawn;" but Belial perceived "The Woman in White" fighting with "The Man in Chains," and "How to Manage it" she did not know. "Once and Again" she seemed "Lost and Saved;" but at last she inflicted the "Cruelest Wrong of All," and fled, crying out "Quits!"

Verily, a "Strange Story." But our American publications afford material for as marvellous a narrative. Think of "Angelina Shoddy," "The Scout in Crinoline," spending "A Week at Saratoga," then left "All Alone" "Among the Pines," and going into "The Wide, Wide World" with "Nothing to Wear" except "Fern Leaves." Surely, the situation is "Peculiar."

AMERICAN EDUCATIONAL MONTHLY.

NOVEMBER, 1865.

THE IGNORANCE OF SCHOOL-TEACHERS.

OF all professional men, teachers are the most ignorant. We do not refer to that kind of ignorance recently shown in New York, when teachers, in sending information concerning needed school supplies and improvements, wrote *cole* for coal, *sense* for fence, etc., and in protesting against a newspaper article on the subject, stigmatized it as a "vindictive correspondans." We are not led to the subject by the result of an experiment in a Western State, where twenty words being pronounced, and twenty teachers required to write them, it was found that nearly one-half the teachers misspelled nearly half the words. Many a learned man is an incompetent teacher; but these persons unable to spell words in common use were not entitled to the name of teachers. And among tolerably good instructors there is often a want of familiarity with some study, or of appreciation of the pupil's character and capacities,—ignorance, in either case, which proves embarrassing to one party and disadvantageous to the other. But it is not on this even that we would dwell. The nature of the ignorance we refer to will be comprehended when we ask, Why is it that men study or learn? What are the advantages of knowledge? Is it of any use to be learned, if learning confers no grace, power, capacity, on life; no readiness, quickness, dexterity, no adaptation to circumstances, no extension of vision, no cosmopolitan feeling, in this age of antagonisms and assimilations?

How is it with some teachers—with many? Here is one for a specimen. He is a worthy man, competent and faithful

in the discharge of the duties assigned him. But what does he know of the general application of scientific principles, of the curious relationship of man to the vegetable world, or even his true position in the animal kingdom, on which modern investigation has thrown so much light? He may be familiar with some of the details, but how does he view the grand landscapes of geology and geography,—where lines cross continents, where are seen the natural boundaries of empires, the causes of climatic vicissitudes, the sources of national wealth or poverty, and even the formation of human idiosyncracies?

What! we have taken him to too high a sphere? Well, stand him in his natural place; view him as a man in practical life. For a man he is, in one sense; and a true and great man he, of all others, should be in every sense. Bowed, wrinkled, and careworn, if old—stooping, and pale or sallow, if young—he is practically ignorant of the laws of his being, has virtually ignored all physiological principles. Year after year, shutting himself up with his pupil-prisoners, he has breathed its poisonous vapors and been the autocrat of his little kingdom; and now his figure and manner testify concerning his cares and administration. The bronchitis of which he complains was not caused by talking to scholars, as he supposes, but by the want of pure air in his school-room, and of sufficient air of any kind in his lungs while speaking. Escort him into your parlor, and his awkwardness is a novelty for your wife; and only good-breeding restrains her friends from nudging each other, if, happily, good-breeding is thus potent in such an exigency. Listen to his conversation. To your more conspicuous friends he shows a deferential complaisance which amounts to servility, but he has a peremptory positiveness of manner; he dwells on details; his conversation flows on without the ripple of the rivulet, yet without the

broad bend and sweep, and especially the rich freight, of larger streams. But go about with him among his neighbors: the mechanics are astonished at his questions, not because of the depth, but rather dearth of knowledge which they evince. Among the energetic, far-seeing men who project and lead the various enterprises of the age, he is as obscure, and as much out of place, as a schoolboy would be at a political caucus. Finally, take him with you to a lawyer's or a broker's office, to your own shop, or warehouse, or counting-room, and though he may be able to unlock for his pupils the mysteries of the "higher arithmetic," even without the "teacher's key," you may obfuscate, circumvent, entrap, and defraud him more readily than men of any other profession, the clergy even not excepted.

The popular reputation of the teacher does not seriously conflict with these representations, and poets, novelists, and artists have had no difficulty in finding living subjects enabling them to represent greater extravagances of ignorance than are here delineated.

The facts of the case are so obvious that, when teachers discuss the question whether theirs is a "learned profession," they have feelings and motives similar to those which actuated a religious convention a few years ago, when, after an elaborate philologico-theologic investigation, the signification of the words *doctor* and *divinity* was satisfactorily determined by the delegates in attendance. They "resolved" that all the clergymen of their denomination were doctors of divinity, and for awhile village pastors and school-house preachers were exchanging congratulatory epistles bearing on the superscriptions a conspicuous "D. D."

The teacher should be—he *must* be, if he would hold his true position and keep free from moral indebtedness to society—an active, affable, popular man; quick, but

not hasty; dignified, but not monkish, churlish, and cynical. He may be far-seeing in his philosophy, but he must not be blind to tricks of trade. He may be familiar with his text-books, but he must not be ignorant respecting the problems meeting his eye on every page of the great book of life. With such qualifications for his general duties as a man and citizen, he will in his professional labors use his ferule with more assurance of making it the lever by which to move the world.

Giuseppe Giusti, recalling his student-days, wrote, in pure Tuscan, some stanzas, one of which we present in pretty blunt English, as especially suggestive to the schoolmaster:

You may con, time by time,
All that learning can span,
And be dubbed LL.D.,
Yet be never a man.
If within your four walls
You learn action alone,
You will stumble, be sure,
On the first outer stone.
From doing to talking
'Tis pretty wide walking.

It is bad for the teacher to sleep during school-hours; but it is far worse for him to go moping or dozing through the turns and angles, the whirl and tumult, the frivolities and labors, and all the nameless changeful conjunctures of practical life.

SERIOUS THOUGHTS ABOUT FUN.

IT was Dr. Holland, we believe, who once said that *play* is needed for men and women *as much* as for boys and girls. He stated a fact which we do not deny. But it is not true that *as much play* is needed by men and women as by boys and girls. And here we state a fact which probably none would deny, and for which no proof is necessary. But if any one should assert that school "amusements" are always real diversion, we would take to argument. To tell the truth, there are

many persons, some teachers even, whose convictions would tempt them to such an assertion. If they would scrutinize the dull features of boys, who often, while engaged in gymnastic exercises, are looking about with wandering, listless eye—if they would take the hand of a girl who has gone through a half-hour's calisthenic enjoyment, when perhaps her health did not warrant her in coming to school, and observe her finger-tips, shrunk and shriveled as though recently taken from a dish-pan—they would be apt to waver in their belief.

We have no desire for a contest, physical or intellectual, with any gymnast, and we are making no effort to topple gymnastics. Calisthenics sometimes do more for the mental faculties of pupils than all their text-books. What we would inculcate is the necessity of a greater proportion of actual self-selected diversion. That which is recreation and diversion to the man, it has been truly said, is often an accumulation of fatigue for the child. Greater reliance should be placed upon amusements of his own choice than upon exercises, motions, and even plays, prescribed after a preconceived plan. At an early age, one duty can not afford relaxation after another duty. On the contrary, when an amusement is *imposed*, it becomes a new fatigue. Recreation and play are necessary, but only on condition that they must be voluntary, free from that contention of mind which is caused by doing a thing by compulsion, or for the sake of obedience. Amusement, without perfect freedom of choice, is void of pleasure; and it is only pleasure which gives the charm to amusement, and by a natural reaction of the moral and physical elements, renders it salutary. Compel a boy to play "hide and seek," and at the end of a quarter of an hour he is tired of it. But had he chosen this he would not be tired of it at the end of two hours. Parents or teachers who pretend to make the physical alter-

nate continually with the moral and intellectual education, by arranging after their own idea the exercises of the one and of the other, and who, holding the child by the hand, compel him to go round a prescribed circle, condemn him also to a slavery as tedious as it is useless. In order to obtain a good physical education, amusements and plays are of the greatest importance. These can not be of any profit except on two conditions, the one being as essential as the other—pure air and perfect freedom.

THE MICROSCOPE—A HINT.

THE Microscope is yearly becoming more effective in our scientific manipulation, and scarcely a week goes by without some practical use being assigned it. Microscopy, however, is rarely heard of as a school study. It should have a place in every high-school where a competent teacher can be procured to make known its utility, and teach the more important of its illimitable applications.

In the British metropolis a movement has been made which we would be glad to see repeated here, and which in the city of New York is perhaps not impracticable. A Microscopical Club has been established in London, with the view of giving to microscopists ample opportunities for meeting and for exchanging views and specimens, and discussing doubtful points of general interest.

Here few devote much time to microscopic investigations, and many who have a general appreciation of the subject could contribute but little for the information of others. But the subject possesses charms as well as utility, and it would doubtless be found that in the carrying out of the enterprise here suggested, there will be found sufficient inducements to cause every member to bring his views, facts, and specimens for the building up such an association.

EDITORIAL CORRESPONDENCE.

PHONOGRAPHY—A REPLY.

BRIGHTON, Mass., October 6, 1865.

PERMIT me, Mr. Editor, to defend myself from the charge of having been too severe in my strictures on Phonography in a previous article. The interests of science demand candor and truth. I do not wish to misrepresent the facts of the case, and there need be no difference of opinion, for the truth can be searched out. Your correspondent "can show that Phonography, instead of having fallen into disuse, is steadily gaining ground." I hope you will allow him to prove a fact so important to our educational interests.

To aid him with a basis, I add the following statistics. In 1857 a catalogue of all the phonographers that could be induced to report to headquarters was published in Cincinnati. It contains the names of about three hundred phonographers, of whom only forty-five could write as fast as one hundred words a minute. Twelve were clergymen. Assuming that only one-half of the phonographers of the country were comprised in this catalogue, we have six hundred in all—thirty who could make a decent verbatim report, and twenty-four clergymen who used the art.

Now will Mr. A., for the good of science, give us reliable data on which we can make a larger list to-day? And as to the multitudes of clergymen who use the art for writing their sermons, will he send the editors of the "Monthly" a list of twenty-four who now do employ the art in this way? I do not say that he can not do this, but I would respectfully suggest that a failure to find even a much greater number would exonerate me from any undue severity in former remarks.

I add a few extracts from letters of clergymen, to show the tone of feeling.

Rev. Thos. Easton says: "After a long and tedious effort at Pitman's system, I am compelled to abandon all hope of its utility to me as a clergyman."

Rev. P. V. Vedee says:—"Counting myself one of the fifty thousand persons who have learned Pitman's system and not been able to make much practical use of it, I have a great desire to see if you can not furnish

me with that which I have failed to find elsewhere—a legible, easily legible system of Phonetic Short-hand. I am a clergyman, and preach mostly from my manuscript, etc."

Rev. W. T. Wylie says: "I am a minister, and have charge of an academy; hence you see I have good reason to feel an interest in Phonography. I have often wished to learn it, but Pitman's system seemed impracticable unless I could use it continually."

Rev. Plumer Chesley says: "Pitman's system (of Phonography) is brief, but not simple. *It will never come into common use.* The public groan to be delivered from long-hand jumbles, but Pitman's Phonography is not the deliverer. The system that is wanted is so true to sound that the marks used shall exactly represent those sounds—one mark only for a sound. Written sound is the thing to be attained. The shape, not position, of vowels must constitute their kind. So simple must it be that a few brief, easy lessons shall compass its attainment."

Rev. William Pillenger, author of "The Great Railroad Adventurer," says: "I have high hopes for Tachygraphy. I find it to be of more and more use to me, and this makes me believe that it will be of use to others. I now write it with an ease that I do not think I could ever have attained in Phonography, although I have not studied it one-tenth as much. We only need time and enterprise to make Tachygraphy the common writing of the land."

Rev. A. C. Row, Chaplain Third Division, Fifth Corps, says: "I am much pleased with the system. I found it of the greatest value on the last marches of our corps, where I had to take many notes, and do much writing on horseback, while in motion. I could write legibly in Tachygraphic characters; my long-hand I could scarcely read when cold. On the late moves I have been constantly topographing the country as we passed, and have found the art worth more than the labor it cost to master it already."

[This was written with only a few weeks' practice of the art, and shows how soon it will repay a man of activity for the labor of acquiring it.]

These are a few testimonials, selected from hundreds of like import, L.

EDUCATIONAL INTELLIGENCE.

NEW YORK.—Teachers' institutes, for the present season, have been organized in the thirty-three counties which we have heard from. In Delaware, Monroe, and Wyoming respectively, two institutes have been pro-

jected. The "Livingston County Teachers' Institute" began its ninth annual session on the 25th of September, and has not yet completed its work, arrangements having been made for a session of six weeks' duration.

There is an evident intention of making this session the most interesting and profitable of any ever held in the county, and we believe that the institute itself will become a model. The faculty embraces twelve experienced teachers; and among the lecturers are Hon. V. M. Rice, James Atwater, Esq., President N. Y. S. Teachers' Association; Edward Danforth, Esq., Superintendent of Public Schools, Troy; Prof. James H. Hoose, of Genesee Wesleyan Seminary; Rev. J. Jones, of Genesee Academy; Rev. W. A. Niles, Rev. W. N. Irish, T. S. Lambert, M. D.; Prof. C. W. Sanders, Robert H. Fenn, the blind poet. The most approved methods of teaching have been adopted, including the latest features of the normal schools of New York, Massachusetts, and Ohio. To the teacher sustaining the best examination in "Intellectual Philosophy" a set of "Cleveland's Compendiums of Literature" is to be awarded, and various prizes for excellence in other studies; and the school district making the most improvements in school buildings and grounds is to receive a school-house-bell and fixtures. The enterprise shown by Livingston County should prove stimulating elsewhere. What county will compete for the honors next year?

Dr. Nott, the venerable president of Union College, now ninety-three years old, is failing rapidly.

CONNECTICUT.—The fall term of the Wesleyan University at Middletown commenced August 31. About fifty have entered the freshman class, and eight or ten the upper classes. The university was never in a more prosperous condition than at present. It is expected that measures will be taken for the immediate erection of the new library building, the required means having been pledged last commencement.

MASSACHUSETTS.—A school of mining and practical geology at Harvard College is to be opened in close connection with the Lawrence Scientific School, on the first Monday in October. Samuel Hooper, of Boston, made the magnificent gift of \$50,000, as a nucleus for the endowment of the school.

Mrs. Waters, of Brookline, Massachusetts, has contributed \$5,000 to the scholarship fund of Brown University, and \$5,000 to the University of Rochester, toward the endowment of the Strong-Place Professorship.

PENNSYLVANIA.—The Legislature last year appropriated \$50,000, and this year \$75,000 for the care and education of her soldiers' orphans. The plan adopted is worthy of imitation. No money is invested in buildings and fixtures; but arrangements are made with schools already in operation, whereby each institution provides for and educates a certain number of orphans for a definite period, say one year. In this way the children are retained near their friends and early homes, and are brought under the beneficial influences of well-regulated fami-

lies and schools. The entire management is under that well-known educator, the former State superintendent, Hon. T. H. Burrowes.

At the recent commencement of Westminster College, the degree of LL.D. was conferred on the Hon. Samuel P. Bates, deputy superintendent of common schools of Pennsylvania. The announcement of this deserved honor will be received with pleasure by his numerous friends.

OHIO.—The Rev. Charles G. Finney has resigned the presidency of Oberlin College, on account of advanced age and uncertain health. He will continue to teach and lecture in the theological department as heretofore.

By the weekly report of the superintendent of the Cincinnati public schools, we learn that there are 931 more pupils enrolled in the schools now than there were at this time a year ago.

DISTRICT OF COLUMBIA.—W. W. Corcoran, Esq., of Washington City, has presented to the corporation of Columbian College his fine building situated on H-street, between Thirteenth and Fourteenth-streets, now occupied by the United States Government as a surgical museum. The building is 60 feet long and 36 feet wide, having 5 feet of vacant ground on either side, and about 21 feet in the rear, and the property is valued at about \$30,000.

There are in Washington nine colored day-schools, whose teachers are supported by tuition fees. There are also twenty-five free-schools, supported by the philanthropy of the North, and eight free evening-schools, voluntarily taught by clerks in the different departments. Neither in its corporate nor individual capacity does the city of Washington pay one cent for the instruction of its colored citizens.

VIRGINIA.—The Virginia colleges are now in the hands of the Lee family. Robert E. is president of Washington College, and his son, George W. Custis Lee, has been appointed professor of engineering in the Lexington Institute. The board of visitors appointed by Governor Pierrepont are, with two exceptions, original rebels.

WEST VIRGINIA.—The township system has been adopted. Free-schools are to be maintained six months each year in every neighborhood having pupils enough for a school. Provision is made for establishing high-schools in each township.

MICHIGAN.—Prof. Welch has tendered his resignation as principal of the State Normal School, which position he has occupied ever since its foundation, and intends to remove to Florida. Michigan thus loses one of her most earnest educators, and a man zealous in the cause of educational reformation.

KANSAS.—In the fourth annual report of the superintendent of public instruction, several important amendments to the school

laws are suggested: 1st. Compensation to school officers. 2d. Authorize and require each district officer to subscribe for the *Kansas Educational Journal* at the expense of the school district. 3d. A law securing a uniform series of text-books in each school district of the State. 4th. Any school district failing to sustain a school three months each year, to lose its identity at the end of two years.

CALIFORNIA.—The city Board of Education has subscribed for one hundred and fifty copies of the "*California Teacher*" to be supplied free to the female teachers of the Department.

— The number of colleges in the loyal States is as follows: Maine, 2; New Hampshire, 1; Vermont, 3; Massachusetts, 6; Rhode Island, 1; Connecticut, 3; New York, 20; New Jersey, 3; Pennsylvania, 20; Maryland, 10; Delaware, 1; Ohio, 24; Illinois, 15; Indiana, 13; Kentucky, 8; Iowa, 7; Michigan, 4; Missouri, 11; Minnesota, 3; Oregon, 3; Wisconsin, 10; California, 4. Total, 172—at least 125 too many.

GREAT BRITAIN.—One thing in which her majesty's inspectors of schools, whose reports have been issued lately, agree, is that women are least satisfactory as teachers of arithmetic. There are complaints, too, on the score of handwriting. The "excessive prevalence" of small-hand is, in particular, a grievance. "I wish," says one inspector, "teachers would remember that, in the words of John Locke, 'every one naturally comes by degrees to write a less hand than he at first was taught, but never a bigger;' and that, therefore, he who learns at school to form every letter well, on a large scale, will fashion a good small-hand for himself afterward without teaching; while he who writes nothing but small-hand at school, will never be a good or legible writer as long as he lives." Another inspector bitterly denounces the "ladies' angular hand." The "reading" in the schools is generally improved, though the standard, in districts like Cumberland, Westmoreland, and Northumberland, is not very high. Mr. Fearon, the inspector for the Church of England schools

in those counties, observes: "The harshness of the Solway, Lake, and Tyneside dialects, seeming in the latter to amount almost to a physical imperfection, together with the natural pride and strong sense of the ridiculous in these north countrymen, militate against good reading aloud. I remember, at a school in the Lakes, where some pains had been taken with reading, but where the scholars had been as usual torturing me with a noise more worthy of parrots than of English children, that a little girl got up in the second class and read with fluency, sweetness, and an intelligent articulation. On inquiry, I found she had lately come from London. To me her reading was a refreshing interlude, but I could see that to the other children it was broad farce—something to be a little amused at, and a good deal despised." Mr. Jack, reporting of the Church of Scotland and other schools, complains of the mode in which geography is taught. It appears that there is a class of schools in which South America is the favorite map. The children are familiar with Venezuela, Ecuador, and the names of the tributaries of the Amazon or the La Plata, but can not point out Glasgow or Liverpool. "The master attacks his subject as it might be well to do were his pupil an inhabitant of another planet, in whose company he happened to be approaching the earth; when it might be proper to begin by informing him first of the globular shape of the earth, of the millions of square miles of land and of sea, and of the general shape and outlines of the four quarters of the globe, and when it might be out of place to touch too soon upon the subject of Great Britain or any little special county in it. But his pupil is a child whose first ideas of geography are taken from the nearest village, rivulet, and hill, and who by the time his teacher has got him past South America, with its hard names, is off to the engrossing labor of a working-man's life. He has already acquired ideas of space and locality for himself. Why should his master not condescend to start, hand in hand with him, from his familiar home center, and show him afterward, if he has time for it, how large is the world?"

CURRENT PUBLICATIONS.

WHAT the boys and girls did for reading in very old times, when books were regarded as an institution for grown people, and the small amount of juvenile literature in existence was mostly of that primer and spelling kind, that was generally applied with the help of a small stick to the understanding, like Day & Martin's blacking to the shoes, we cannot say; but we remember that in our own not very remote childhood, there

was a sad dearth of material for little eyes to pore over, and the least roll of paper that looked like a picture-book was a precious godsend. It is positively true, that among our most fervent causes of joy in boyhood, at the coming of the New-Year, was the prospect of having a new number of the old Farmer's Almanac to devour eagerly—stories, riddles, weather notes, moralizing, and all at one sitting, if possible—and then to

fumble over it again and again, until the old year should wear out and January come in sight again.

Times have marvelously changed, and the favored class of children, ours among them, have a larger and better supply of books now than were generally to be found of old in a fair average family library. It can not indeed be said that there is no chaff in the wheat, and that our juvenile literature is as memorable for its quality as its quantity; yet, quite sure we are, that there is as much good reading now for children as their brain can properly receive, and the great need is not so much of a new supply as of a judicious selection from the materials already on hand or regularly forthcoming. It is on this account that we are friendly to the magazines for children that concentrate so much ascertained truth, and give so much innocent amusement in short, taking articles; and throw, moreover, the light and charm of apt and handsome illustrations upon whatever articles are helped by the aid of the pencil and the block. Our established writers here also appear in a new field, with all their well-won honors; and our young people are glad to take them by the hand and be led on from month to month under their kindly care.

We will take for our text the new illustrated magazine, "*Our Young Folks*,"⁽¹⁾ published by Ticknor & Fields, and just finishing the third quarter of its first year. The prospectus was somewhat startling, in announcing for its editors three persons of established name in our letters—J. T. Trowbridge, Gail Hamilton, and Lucy Larcom; and thus declaring that the new work, though meant undoubtedly to be full of pleasantry, was to be no joke, but a very earnest and laborious enterprise, under talents the most various and effective. It is simple justice to say that the promise has been more than kept by the performance. The editors have done worthily, and kept their high repute, and have been greatly favored in the list of contributors whom they have called. Mrs. Stowe, Edmund Kirke, Dio Lewis, Carleton, Mayne Reid, J. G. Whittier, Mary K. and Harriet E. Prescott, T. W. Higginson, Rose Terry, H. W. Longfellow, John Weiss, Louisa M. Alcott, M. T. Canby, L. Maria Child, Maria Douglas, Anna M. Wells, Tacie Townsend, Mrs. Diaz, J. H. A. Bone, T. B. Aldrich, and many others of note are on the title of contents. Where can more ability be found within the same compass, and where a greater variety of themes freshly handled?

Here are, of course, stories of different kinds and qualities, yet not one that we would willingly spare, although our preference is for those simple, touching, truthful, home narratives, that present nature and life at once to the mind and heart of childhood. Mrs. Stowe be-

gins the January number with a gem of this sort, in the exquisite sketch of a humming-bird, "*Hum, the Son of Buz*." Mr. Trowbridge follows her lead well in his serial, "*Andy's Adventures*;" and gives proof that the gentle wisdom of our day may guide a few that can call up all the weird spirits of the old gothic times. Then Carleton's "*Winning His Way*" takes the hearts of all the boys, and, of course, does not leave the girls wholly indifferent to his merits.

Without going into a full characterization of these and other stories, we note the large scope of the magazine—its admirable sketches of natural scenes and objects; its historical and biographical narratives; its tales of adventure, such as Mayne Reid's; its excellent hints on health; its good specimens of poetry, winning in simplicity and beauty—though, perhaps, a few pieces may be a little over the heads of most young folks; and last, but not least, the best collection of charades and rebuses.

There is no set theology in the work, nor any formal preaching, yet a good spirit issues through its pages, and the morals and tempers of the readers will be safe so long as Father Bright hopes is their spiritual adviser, and Gail Hamilton their humorous censor, and Lucy Larcom their loving minstrel.

The editors mean to be liberal in their allowance of fun as well as of wisdom to their readers, and the lessons in magic may teach a grave moral as well as raise a merry laugh about many a fireside of a winter's night, by showing that things are not always what they seem, and all is not gold that glitters.

We can think of many articles that might be written for this monthly that have not been written, and it is easy to suggest whole branches of topics suitable for series of papers. But the wonder is that so much has been done and so well thus far, and that the public have been as ready to appreciate the high merit of this beautiful and generous juvenile magazine as the editors and publishers have been to provide it. In such an undertaking considerable capital is needed, and we commend the publishers for their generous outlay.

There is one encouraging fact that should cheer all parties concerned. When the year is finished, the numbers make a charming and complete volume, with admirable illustrations, and after giving delight to each new month with their single gems, they will crown the New Year with their whole diadem of jewels. We may have written a little strongly of the merits of this work, but the subject is somewhat of a hobby of ours, and as old Admiral Farragut said when he brushed away the tears from his eyes with his gold-laced sleeve, when he heard a thousand little children sing their hymns at school, "*Children are my weakness, and what pleases my children pleases me.*" This weakness is no proof of foolishness, however,

(1) *OUR YOUNG FOLKS*. BOSTON: TICKNOR, FIELDS & CO. Large 12mo. \$2.25 per annum.

either in us or the admiral, for that tough old sailor, after he had cried over the children, sailed into Mobile Harbor with his body lashed to the rigging, that he might keep his place, even if wounded, and give through his trumpet the word of cheer to the right flag, and of downfall to the wrong. We commend "Our Young Folks" to all staunch patriots like him, for it is full of sound American principles for boys and girls, and everybody else.

Latin composition has never received from American educators that attention which it deserves. This has arisen from two causes: first, a lamentable want of thoroughness in our curriculum; and, secondly, this system has not produced teachers who have been able to raise the standard with any degree of rapidity. In exactly the ratio that the standard of a Latin education rises, in this ratio will increased attention be paid to Latin composition; and, conversely, we must urge that greater care be given to Latin composition in order to raise the standard of Latin scholarship.

We hail with delight any book which will take a single step toward freeing us from the thralldom of the wretched examples and still more wretched system of Arnold, which seems to reign almost supreme in our preparatory schools. In no department of study is there greater need of new books.

Dr. Smith's *Principia Latina*³ is a great improvement upon Arnold, in system and exercises, and we recommend it to those who wish a short course in composition. Those who wish thorough and lengthened exercises must look elsewhere. We notice two or three points to which we must take exception.

The nomenclature of the tenses leads him to call the perfect the present-perfect. This is too much like the division of the perfect, by Arnold and others, following Zumpt, into the perfect-definite and indefinite, which distinction does not exist in Latin. The perfect, like the pluperfect, is used as a secondary tense, and all deviations from this are exceptions.

He proposes to introduce a simpler and easier classification of the third declension. On p. 11, he says that the "stem" of *urbis* is *urb*, and ends in *b*; on p. 17, that the stem of *hostis* ends in *i*. How this is, from his rule of separation of the paradigm, we do not see; and how he explains the *i* in the genitive plural, we can not conceive. We believe the stem can only be found invariably in the third declension by cutting off *um* in the genitive plural, and then we find the "stem" of *urbis* to be *urbi*, and the stem of *hostis*, *hosti*, both thus belonging to the same class with the vowel characteristic *i*. With this

as a starting point, we can explain the form of the accusative in *im*, the ablative of neuter in *i*, the neuter in *ia*, and the genitive plural in *ium* by *i* falling out, or forcing out *e* and taking its place. All nouns with the genitive plural in *ium*, whether feminine or neuter, whether they end in *is* or *s*, preceded by a consonant or *x*, belong to the vowel class with the characteristic in *i*.

We notice, also, he gives the accusative plural of *duo* as *duos*, whereas the usual form is *duo*, and should at least be mentioned, as is generally done by grammarians. If either form is omitted it should be *duos*.

The number of new books on history is a happy omen of increasing interest in that study. It would be idle to speak of its importance. In this country we are rapidly following the example of the English and continental schools in the great attention which they pay to this subject. Colleges are founding professorships of history, and every form of text-book is rapidly appearing.

The *Smaller History of Rome*, by Dr. Smith,³ while it is an epitome, is by no means a child's book. It is a clear and simple condensation of the facts connected with the internal and external history of Rome, without any lengthy discussion. It is a bird's-eye view—a history for *beginners*, of whatever age they may be. We believe, indeed, that more advanced classes will learn history much faster and with infinitely greater interest by memorizing such a compendium, to be followed by the teacher extending the subject with lectures and explanations, than by dragging the weary memory through the pages of our larger manuals. Taught by the aid of interesting lectures and illustrations, history is the most fascinating of studies; when taught by simple memorizing it may easily be very tiresome.

Nations, like individuals, have but a limited period of existence; an unwelcome doctrine truly, yet confirmed by history and analogy. Rome, Greece, and Egypt grew from weakness and barbarism to strength and civilization; then died to make way for others advancing. An individual, by attention to the laws of health, may attain to greater age; so a nation, by careful study of the details of civil policy and by avoiding the errors of its predecessors, may prolong its existence. To us, as Americans, in view of the crisis of reorganization, through which this nation is now passing, the question of our future civil policy is especially important. Hence Dr. Draper's work,⁴ resulting from long and accurate investigation, is especially

(3) DR. SMITH'S SMALLER HISTORY OF ROME. New York: Harper & Brothers. \$1.00.

(4) THOUGHTS ON THE FUTURE CIVIL POLICY OF AMERICA. By JOHN WILLIAM DRAPER, M. D., LL. D., Professor of Chemistry and Physiology in the University of New York, etc. New York: Harper & Brothers. Large 12mo, pp. 325. \$2.50.

(2) PRINCIPIA LATINA.—Part I. By WM. SMITH, LL. D. Revised by H. DRESLER, LL. D. New York: Harper & Brothers. 75 cts.

welcome. Our republic, in its efforts to establish and maintain unity of government within its present limits, must solve many problems of more than ordinary difficulty, if it would be successful. Its most dangerous opponent is climate. This, when hot, and characterized by only slight changes of temperature, produces homogeneity of thought and an indolent disposition; but where the changes are great, it causes industry and intellectual activity. Different climates, therefore, tend to difference in customs and ideas; if the contrast be great, these will necessarily clash. In the United States we find five distinct climates—four at the North, somewhat similar to each other, but entirely unlike the fifth, at the South. Here, then, we have five natural divisions, in each of which peculiar manners obtain. Can these varying elements be harmonized? The problem is indeed complex, yet its solution is simple. *Locomotion*, our railways, canals, and telegraphic lines are to be our bond of union. Dr. Draper firmly believes that had there been a constant stream of Northern travel through the South during the last ten years, our civil war could never have occurred. The vast flow of immigration to our shores, though attended with many advantages, will add difficulties. In society there are three classes: those who see and discuss matters for themselves; those who accept and adopt the opinions of the first; and the peasantry, or those who have no opinions at all. The first class makes a nation. Unfortunately we receive few from it, the great majority being from the second and third, which are mostly of uneducated, unthinking people, and therefore measurably retard our development. These must be elevated and absorbed. Education, free and unrestrained, is the agent for their advancement and our protection. But while we see physical agencies exerting so powerful an influence, the political force of mere ideas must not be overlooked. A single pithy sentence may overturn or preserve a nation. The watchword, "There is but one God, and Mohammed is his prophet," filled a race with infatuation, and enabled it to overthrow half the world, conquering nations and overturning established forms of thought and religion. The Jews look forward to a coming Messiah. This hope has led them to resist all allurements, to suffer persecutions, and still to remain a distinct people. We have one all-prevailing idea—the unity of government on this continent. For sake of this we have raised an army and built a navy, which compare favorably with those of Europe; from a purely commercial nation, we have developed into a vast military power, and for four years have expended eight hundred millions of dollars per annum. If, then, mere ideas are at times so pregnant with results, it is the duty of our nation to encourage freedom of thought. We must avoid the intolerance of Europe, must encourage every form of science, and elevate our

standard of education. We regret that our space will not permit us to give the measure of the book. It is wealthy in facts, drawn from every department of science. It is in the highest degree interesting and instructive, and will prove a really valuable addition to the library. Still it is imperfect. It lacks compactness: the illustrations are loosely thrown together in such profusion that at times it is difficult to follow the line of argument. Digressions are too frequent, and detract from the unity of the work. In many places the style is cumbrous, and evinces haste in the preparation. These, however, are only blemishes which, perhaps, might be unnoticed in a work of less sterling merit. The book is beautifully gotten up, and reflects credit upon the publishers.

Thousands of persons have an exalted idea of Robert Browning, as a poet, who have never seen a single line of his poems. They have heard of the "freedom of movement" which characterizes his writings, they have seen the words "strength," "originality," and "word-painting" applied to his poems—but in what way this freedom and originality are shown, they know not; and we suspect that some of the critics who have used these expressions would find it difficult to demonstrate their appropriateness. Any one, however, who wishes to have a specimen of Browning's poetry can now obtain a fair sample at a low price. Nearly sixty of his lyrics have been published in the neat and popular form to which we recently adverted. Although the book comprises only about one hundred pages, it will enable any unbiased, discriminating mind to judge of the pertinency of the eulogiums so lavishly bestowed on the man who, in giving to Elizabeth Barrett Browning her name, did more for the perpetuity of his own than he could ever have effected by his writings.

Mr. Emerson is an eccentric genius, full of good intent, but doomed, we fear, to remain unappreciated. In the tract* which we have just received, he maintains that the duodecimal is much superior to the decimal system, as it is easier to reckon by dozens than by tens. We doubt, however, whether he will succeed in introducing his theory against the influence of the whole scientific world. The tract is exceedingly ingenious, and, like the "Logic of Algebra," by the same author, is worth far more than its price as a mathematical curiosity.

Silliman's Journal for September is interesting. It contains, among others, Experi-

(3) *LYRICS OF LIFE.* By ROBERT BROWNING. With Illustrations by S. Rytting, Jr. Boston: Ticknor & Fields. Small 16mo, pp. 101; 50 cts.

(4) *THE DUODECIMAL SYSTEM.* Addressed to scientific men, business men, and legislators. By Samuel Emerson, A. M. New York: Scherhorn, Bancroft & Co., pp. 4; 5 cts.

ments with the Ammonium Amalgam; Contributions to the Chemistry of Natural Waters; a continuation of Warren on Volatile Hydrocarbons; and Walling on Gravitation. The magazine has been enlarged to its former size, and the summary of scientific intelligence is therefore more satisfactory. The price per annum is only five dollars, and no conscientious teacher of the sciences can afford to be without it.

A new work* on petroleum has a glowing preface, in which the author states that he has entered minutely into the physical formation of the oil region, and calls especial attention to his statistical and financial developments. He assures us that "the facts and figures now given to the public for the first time, together with the modes of taking in . . . knowing Eastern people will tell." If his figures are not more accurate than many of his statements, they will "tell" any thing but the truth, and will not suffice as data on which to risk an investment. While

criticising the "newly extemporized linguists," who speak of "a contributory to Sugar Creek," and desire the "envelopment of the country," he conjectures that Dame Partington has been giving lessons in the oil region, and suggests the idea that "her ladyship has 'oil on the brain.'" But what then shall we say of our author, when, instead of carburetted, he speaks of "carbonetted hydrogen," a specimen of nomenclature suitable for a Partington lexicon; and when he informs us that the people who formerly shipped petroleum on Sunday as well as Saturday, have now "the advantage of a septennial day of rest." If this latter statement is incorrect, if in reality the day for rest and worship occurs oftener than once in seven years, how are we to account for this and similar errors, as when he makes the word *Petrolia* denote a substance as well as a locality? The only explicatory hypothesis is, that our author has something stronger than oil "on the brain;" or, possibly, that the brain in question exists in a state of preternatural dilution.

The work contains much that will interest many, and comprises statistics and facts which were in part given to the public, by another writer, half a year ago.

(*) THE OIL REGIONS OF PENNSYLVANIA. Showing where Petroleum is found; how it is obtained, and at what cost. By WILLIAM WRIGHT. New York: Harper & Brothers. 12mo, pp. 273.

NOTES AND QUERIES.

NOTES.

Ruled Paper.—Before the use of envelopes for letters became general, the fourth page of a sheet of letter-paper was not expected to be written upon, and was appropriately left unruled. But at present the blank page is an annoyance, a defect, and constant reminder of the tyranny of customs and habits. When letter and note papers are ruled at all, the fourth page should not be excepted. If this paragraph finds its way into the columns of the "MONTHLY," and the paper-dealers take the hint, they will certainly profit by it even in a pecuniary sense, and the convenience of letter-writers will be promoted.

PETER PAPYRUS.

Facts for the School-room.—Here are some facts and figures respecting the strength of various materials, which, with a little ingenuity, may be made useful and interesting in the school-room:

Iron, one of the most abundant materials in nature, is the strongest of all known substances. Made into best steel, a rod $\frac{1}{4}$ inch in diameter will sustain 9,000 lbs. before breaking; soft steel, 7,000 lbs.; iron wire, 6,000; bar iron, 4,000; inferior bar iron, 2,000; cast iron, 1,000 to 3,000; copper wire, 3,000; silver, 2,000; gold, 2,500; tin, 300; cast zinc, 160; sheet zinc, 1,000; cast lead,

55; milled lead, 200. Of wood, box and locust, same size, will hold 1,200 lbs.; the tough est ash, 1,000; elm, 800; cedar, white oak, and pitch pine, 600; chestnut and soft maple, 650; poplar, 400. Wood, which will bear a very heavy weight for a minute or two, will break with two-thirds the force acting a long time. A rod of iron is about ten times as strong as a hempen cord. A rope an inch in diameter will bear about two and a-half tons, but in practice it is not safe to subject it to a strain of more than about one ton. Half an inch in diameter, the strength will be one-quarter as much; a quarter of an inch, one-sixteenth as much, and so on.

P. M. J.

QUERIES.

Geography.—Will some of the readers of the "MONTHLY" answer these questions:

Was the division of Virginia a permanent division, or only a measure designed for war-times? If permanent, what is the capital of West Virginia? Is Frederic or Annapolis the capital of Maryland? The New York "Herald," in 1862, inserted in its columns the change of the capital from the latter to the former place, but I have never seen the change noted in any of the recent geographic publications.

K. E. P.

REPLIES.

Petroleum.—Does the theory that petroleum is the product of the destructive distillation of coal by means of the earth's internal heat, accord with the opinion expressed in the "MONTHLY" articles on petroleum? And is this the true explanation? **PENCHARD.**

[The articles referred to did not assume to offer any theory, but to make known some of the ideas already advanced. The latest view is the exact converse of the one stated. It is urged that instead of petroleum being formed from coal, coal was formed from petroleum; that the materials from which our coal-beds were formed were converted into oils, which, losing their oxygen and nearly all their hydrogen, gradually became solid.—J. W. H. C.]

Charred Wood.—My scholars are interested in the charring of the posts for our new fence, and want to know whether the principle is extensively applied in the arts. Can you answer and give any facts relating to the subject? **HEWITT.**

[The charring of wood for the purpose of preserving it consists in the forming of an outer surface of carbon impregnated with the empyreumatic oils and creosote resulting from the carbonization. It has long been resorted to, but not on an extensive scale. A process is about to be introduced

into the dock-yards of France, in which a blow-pipe will be used, throwing a gas-flame upon every part of the wood as required for proper torrefaction.—J. W. H. C.]

Lightning-Spectrum.—Has the spectrum produced by the lightning-flash been studied or received any attention? **E. C. STILES.**

[It has been examined by the Abbé Laborde. The lines seen are of a dull white or lead color—one always more distinct than the others. Sometimes only one is seen.—J. W. H. C.]

Amount of Precious Metals.—My pupils were so much interested in the "Object Lesson on Gold" in the "MONTHLY," that they want to know the quantity of gold in the world. Can Notes and Queries tell, and of silver? **L. WALLACE.**

[Approximative estimates only can be made. At the beginning of the sixteenth century the amount of the precious metals was only \$200,000,000. American productions had in 1848 increased this to \$8,915,000,000. According to Mr. Roswag's work, "*Les Métaux Précieux*," the amount of precious metals was, during the following ten years, increased by \$434,000,000, silver; \$1,200,000,000 gold. Since 1856 the total annual increase of silver has been about \$50,000,000, silver; gold, \$100,000,000.—J. W. H. C.]

SCIENCE AND THE ARTS.

—A Dr. Boisson has discovered that a vapor bath at 93 degrees F., gradually reduced, is a certain cure for hydrophobia. The bath is to be taken *à la Russe* for seven days. He affirms that he has thus treated eighty patients, some of the cases very bad, and never lost one.

—The waters of the Lake of Constance have been so low as to allow important researches to be made concerning the locustrian habitations. The objects chiefly found were corn, kitchen utensils, woven fabrics, and plated articles. Every thing taken up was deposited in the Wessemberg Museum of the town.

—A French printer has succeeded in making gas for lighting with the refuse of apples and pears used in making cider and perry. This gas is said to be superior to that made from coal, as it emits neither smoke nor smell.

—A machine was exhibited at the recent *soirée* of the Royal Society, London, by which all the particulars as to the speed and stoppages of railway trains are registered

and recorded on a sheet of paper, in the form of a diagram, giving with the greatest precision all the information wanted.

—A few caverns, near Beyruth, were recently explored in the hope of finding antediluvian remains in them, and, indeed, several flint instruments were dug up as evidence of the "age of stone" in these parts. The expedition visited Masada, the last stronghold of the Jews, of which Josephus relates, that, after the fall of Jerusalem, 300 men retreated to this spot and held out against the Romans as long as there were any; but that, finding themselves unable to resist any longer, they appointed ten of their number to be the executioners of their comrades, and that these, after performing this horrible task, slew each other, so that only two women and a few children remained to tell the tale. This stronghold is a rock, accessible only by two narrow winding paths, leading over frightful precipices. There are still some ruins visible at Masada, besides the trenches of the Roman general, Silva, who besieged the place.

—Chalil Bey, the Turkish ambassador

has presented to the Emperor of Russia, for the Museum of the Ermitage, a magnificent collection of antiquities discovered in excavations in Egypt, and among others fifteen figures in bronze inlaid with gold and silver, a statue of an Osiris in a standing posture, and another in a sitting one; also a cat, consecrated to Osiris, and several statuettes of kings, of which three belong to the period of the Ethiopian pharaohs. There are also some remarkable pieces of the Ptolemean period, and among them a bust of Serapis and the bust of a queen with the attributes of Isis.

— In some of the mines of San Domingo, the Romans dug draining galleries nearly three miles in length, but in some places the water was raised by wheels to carry it over rocks that crossed the drift. Eight of these wheels have recently been discovered by the miners who are now working the same old mines. The wheels are made of wood, the arms and felloes of pine, and the axle and its support of oak, the fabric being remarkable for the lightness of its construction. It is supposed that these wheels can not be less than 1,450 years old, and the wood is in a perfect state of preservation, owing to its immersion in water charged with the salts of copper and iron. From their position and construction the wheels are presumed to have been worked as tread-mills by men standing with naked feet upon one side. The water was raised by one wheel into a basin, from which it was elevated another stage by the second wheel, and so on for eight stages.

— A company engaged recently in boring for oil in Wirt County, West Virginia, struck a rich vein of antimony, a rare and expensive metal, in great demand for type-casting. The sum of \$350 per ton was at once offered for all the discoverers could supply.

— The Cochinchinese possess a secret for protecting wooden vessels against the depredations of the teredo, an insect which does immense damage to ships and timber on the shores of the Black Sea, the Mediterranean, the Asiatic, and other waters. The Cochinchinese refuse to tell the secret; but Lieutenant Mariot, by diligent inquiry, ascertained that it consists in the employment of a mixture of resin and oil obtained from trees in the country. He further ascertained that it is so effective as a preservative, that junk—so old that the precise year of their construction is forgotten—are, though constantly plying in waters in which the insect abounds, still sound and strong. He has communicated his discovery to the French Emperor, who has manifested great interest in it; and, at his majesty's request, Lieutenant Mariot is to return to China to make further inquiries, and to bring back some of the wood steeped in the mixture.

— The manufactory of St. Gobain, Aisne, France, has been employed six years in fabricating a lens two feet in thickness, which it has now given to the Observatory of Paris for the large telescope in course of being manufactured, the power of which will exceed that of the most powerful instruments known.

— The railway velocity indicator, invented by Mr. W. A. Brown, of London, when fixed inside a railway carriage, records the speed of the train at all parts of the journey; the journey, the stoppages, the shuntings, and, indeed, all that befalls the train, including the exact time of an accident. The record is a line traced by a pencil on a sheet of paper, moved by clockwork; where the speed varies much and stoppages occur, the line represents a series of curves more or less acute.

— In topographical surveys much use is made of sun signals, flashed from one high elevation to another, fifty or seventy miles apart. In practice some difficulty is experienced in so placing the mirror at the exact angle for catching the sun and transmitting the flash. This difficulty is overcome in the heliotrope invented by Professor W. H. Miller, of London. It is a small parallelogram of thick, silvered glass, from which, at one corner, a portion of the silver, about the extent of a pin's head, has been removed. The observer, looking through this small hole, directs the mirror to the sun, and when he sees an image of the sun reflected on the two angles of the glass under the hole, the mirror is in the true position for flashing the signal.

— Experiments have been made in Paris with an apparatus, invented by M. Galibert, to enable a man to breathe in the midst of deleterious emanations. A quantity of flour of sulphur was set fire to in a cellar, and several persons descended into the sulphureous atmosphere with perfect comfort. Similar experiments have been performed at Versailles, and latterly in one of the cellars of the Société d'Encouragement. When the air in the reservoir has become foul by the action of breathing, fresh air may be easily introduced; the knapsack, which is of metal, has a tin bottom, but the lid consists of a skin or leather bag. To drive out the foul air this leather bag has only to be pressed down, and to fill the space with fresh air the bag is pulled up again.

— While we throw aside as useless our broken or cracked kitchen utensils, the Chinese dexterously mend the holes and cracks. The tinker scrapes the surface of the broken vessel clean; he then fuses a portion of cast-iron in a crucible the size of a thimble in a furnace about as large as the lower half of a common tumbler. The iron, when melted, is dropped on a piece of felt covered with ashes. It is pressed inside the vessel against

the hole to be filled up, and as it exudes on the other side it is struck with a roll of felt also covered with ashes; the new and old iron adhere, and when the superfluous metal is removed the operation is complete.

— The action of sea-water upon cast-iron is curious, converting it at length into a gray porous mass, that grows rapidly hot upon exposure to the air. In 1740, some iron guns, that went down with the Spanish Armada near Mull, in Scotland, were fished up. On scraping them they soon became so

hot that they could not be touched. In all probability this gray porous mass was simply the carbon of cast-iron, the metal having been converted into chloride of iron by the sea-water and so removed, since these very guns, to which Dr. Perry refers, were, when fished up, so light that, although 32-pounders, one man could easily lift them.

— A French chemist proposes to prevent the oxidation of iron and steel by the forced incorporation of volatile metals having little affinity for oxygen.

MISCELLANY.

— The estimates for day scholars in elementary schools in England, for the present financial year, is 897,513, at 9s. 3d. each.

— A human mummy has been found imbedded in guano on the coast of Africa. Under the microscope crystals of ammoniacal salts are visible, to which substance the preservation is doubtless to be attributed.

— The last joke at the expense of the French Society for the Protection of Animals is to the following effect: A countryman, armed with an immense club, presents himself before the president of the society, and claims the first prize. He is asked to describe the act of humanity on which he founds his claim. "I saved the life of a wolf," replied the countryman; "I might easily have killed him with this bludgeon," and he swung his weapon in the air to the intense discomfort of the president. "But where was this wolf?" inquires the latter; "what had he done to you?" "He had just devoured my wife," was the reply. The president reflects an instant, and then says: "My friend, I am of the opinion that you have been sufficiently rewarded."

— There are more marriages in Scotland on the last day of the year than in any week of the year, excepting the week in which that day occurs. By the late returns the marriages in the eight principal towns would average some twenty-five a day—that is to say, a work-day, for marrying is one of the things not to be done in Scotland on Sunday—but the registrar-general states that in fact there are more than four hundred marriages in those towns on the 31st of December.

— For three years in succession the voters of his city have honored Ex-President Buchanan with their suffrages as constable to the extent of an election; and thrice, under the law requiring it, has he gone to the proper authorities and made oath that his election was without his wish, knowledge, or procurement, and that he did not desire to hold the office.

— "Sire, one word," said a soldier one day to Frederick the Great, when presenting to him a petition for the brevet of lieutenant. "If you say two," answered the king. "I will have you hanged." "Sign," replied the soldier. The king stared, whistled, and signed.

— Strikes have in fashion in France, the bachelors of Marseilles, to the number of four thousand, between the ages of twenty and thirty, have held a meeting and entered into an agreement not to ask any young woman in marriage until a complete change shall have taken place in the manner of living, and particularly in the dress of the fairer sex. The young men insist on greater simplicity in every respect, and a return to the more modest habits of a century or two ago.

— A lady asked her gardener why the weeds always outgrew and covered up the flowers. "Madam," he answered, "the soil is mother of the weeds, but only stepmother of the flowers."

— In the midst of a stormy discussion a gentleman rose to settle the dispute. Waving his hands majestically over the excited disputants, he began: "Gentlemen, all I want is common sense—" "Exactly," Jerrold interrupted, "that is precisely what you *do* want!" The discussion was lost in a burst of laughter.

— "I gave the fellow a shilling," said Sir Walter Scott, on some occasion when sixpence was the fee. "Remember you owe me sixpence, Pat." "May your honor live till I pay you!"

— A French chemist asserts that if tea be ground like coffee before hot water is put upon it, it will yield double the amount of exhilarating qualities.

— Photographic pictures cannot be relied upon as permanent. At a recent sale in England, forty continental views, which had cost the artist \$100, sold for twenty-five cents—all traces of pictorial representation having faded away.